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Citizens or Clients? Evidence on Opportunistic Voting from a Natural Experiment in Greece¹

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Abstract

We exploit the act of the conservative Greek government (2004-2009) to fiddle the books as a natural experiment in order to document a causal link between government spending and electoral fragmentation and identify the mechanism via which it operates. The retrospective revision of Greece's deficit figures just prior to the 2010 regional elections constituted an information shock which generated expectations for reduced pork-barrel spending. We decompose the resulting effect and uncover the main mechanism taking place: rent-seeking voting and patronage (client-voters abandoning the dominant parties due to less expected rents). We find that expected spending cuts caused a steep decline (increase) in the electoral support for dominant parties (fragmentation). This effect is significantly more pronounced in patronage-intense regions. Using the size of public sector as a proxy for patronage (Hicken 2011) we find that support for dominant parties declined differentially by 5 percentage points more on those regions. That is, at least one in six voters that abandoned the big parties did so out of purely opportunistic motivations. Overall, our work highlights the importance of institutional constraints in affecting electoral and political power-sharing.

Keywords: Greek elections, natural experiment, electoral fragmentation, government spending, machine parties, rent-seeking, clientelism, protest voting, economic voting, trust.

1. Introduction

It is suggested by many scholars (see e.g., Acemoglu and Robinson 2012) that economic and political outcomes appear to be increasingly intertwined. This implies that it is not an easy task to determine the exact direction of the relationship between economic conditions and electoral outcomes. As a result, it is still an open question whether more fragmented party-systems tend to induce significantly higher levels of government spending and debt (Persson et al. 2007) or whether the ability of *dominant parties* to use government resources and the public purse for opportunistic purposes (pork-barrel spending) actually determines how fragmented the *party-system* will be.¹ More importantly, though, identifying the channel that links government spending with *electoral fragmentation* still remains a challenging task. Clearly, the answer to the latter question can have important implications both in understanding the determinants of political success and also in promoting good governance and the design of institutions. It is exactly this dual task that we undertake in this paper. First, we will provide evidence in the direction of this relationship and document empirically that expected government spending determines the degree of electoral fragmentation and support for dominant parties. Second, we will propose a channel that connects those two: machine politics and clientelism operating via strong patronage linkages between voters and dominant parties.

¹ The terms *electoral* and *party-system* fragmentation are used interchangeably in the literature. They measure the dispersion of vote shares (and thus electoral power) among parties.

Our main working hypothesis is that rent-seeking voters (clients) lend their support to those parties (the dominant ones) that can utilize the public purse in order to distribute more “pork” to their electoral clientele, mainly via increased government spending. Hence, conditional on the public finances being strong and the degree of institutional constraints being low, dominant parties can exploit their preferential access to the public purse in order to consolidate electorally and increase their votes (Golden and Picci 2008; Stokes 2005). But what will happen if suddenly “pork” becomes unavailable? Clearly, less expected government spending implies less support for dominant parties and hence more electoral fragmentation. Nevertheless, disentangling the causal forces that are driving this relationship and isolating the mechanism that is in operation can be a quite complicated endeavor. The reason is that usually there are many competing mechanisms which present themselves as plausible explanations to the above relationship. Hence, if the effect operates via our specified mechanism, we should expect that this increase in fragmentation will be more pronounced in those patronage-intense (high public sector) regions² where large spending cuts are expected to have a greater impact on the durability of the clientelist network and thus voters’ behavior. Moreover, stylized evidence from the 2010 Greek elections seem to support this claim, as it can be clearly seen by the differential increase in electoral fragmentation in those patronage-intense (high public sector) regions (Fig. 1).

[INSERT FIGURES 1.A & 1.B ABOUT HERE]

Therefore, we use the data from Greek elections in order to tackle this complication and test our main hypothesis on the mechanism (clientelism and machine politics) that links government spending with electoral fragmentation. The reason is that we can exploit the act of previous Greek government to fiddle the books, from 2005 to 2008, and their subsequent retrospective revision in 2010 (see Fig. 2 and 3) as a natural experiment. The intuition is clear: this retrospective revision uncovered the true level of Greek public deficit and debt and revealed the overall poor health of Greece’s public finances (see e.g., Simitis 2014). In turn, this altered voters’ expectations on how much pork (electorally

² The size of the public sector is a good proxy for the intensity of clientelism. As Hicken (2011) notes “[...] the most commonly used proxy for clientelism is some measure of the size of the public sector, be it the public wage bill or the number of government employees.” Others also make the same point (e.g., Robinson and Verdier 2013, Keefer 2005, Keefer and Vlaicu 2005). For instance, Robinson and Verdier (2013) offer a clear insight as to why public sector employment can be used as a proxy to measure the intensity of patronage and clientelist networks. They note: “A [public sector] job is a credible way of redistributing when it provides rents (such as in situations with moral hazard), and employment is optimal ex post. Moreover, a [public sector] job is selective and reversible, and thus ties the continuation utility of a voter to the political success of a particular politician.” This is particularly the case with public sector employment in Greece, especially during the period from 2005 to 2008, when the majority of all newly-hired employees were hired under schemes of fixed-term, short-duration but renewable contracts, thus making the continuation of their employment contingent on the electoral success of the political party that hired them.

motivated spending) the dominant parties can now deliver through patronage. Hence, the retrospective revision revealed new information and acted as *information shock* that generated expectations for drastically reduced pork-barrel spending. This meant that the ability of dominant parties to credibly promise more “pork” was practically extinguished, thus weakening the electoral importance of those patronage linkages. As a result, rent-seeking voters, who used to form the core constituencies of machine (dominant) parties, were now less likely to vote for them, *ceteris paribus*, leading to a steep and differential increase (decline) in electoral fragmentation (support for dominant parties) in those regions in the 2010 elections (see Fig. 1).

1.1 Our Contribution

The main contribution of this paper is twofold. First, by demonstrating the existence of a *negative* (positive) relationship between government spending and electoral fragmentation (support for dominant parties) we uncover a causal link between those two variables that previous literature has so far ignored (see e.g., Persson et al. 2007).³ More importantly though, by documenting a differential increase in electoral fragmentation in those patronage-intense regions, we are able to pin down the actual *channel* through which this reverse link operates: patronage and *machine politics*. Moreover, apart from uncovering the mechanism taking place, this paper also aims to demonstrate the prevalence and importance of political clientelism and patronage in determining electoral outcomes even in an advanced EU member-state, such as Greece, which we use as a case study.

Furthermore, in addition to the above mentioned mechanism, we also explore alternative channels (e.g., protest or economic performance voting) through which reduced government spending and bad public finances can affect support for dominant parties. We are thus able to disentangle the relative impact of the two effects (performance voting versus rent-seeking) on the Greek vote between 2010 and 2012, by demonstrating that the two main mechanisms are operating in tandem: machine politics taking place in patronage-intense regions, and protest voting occurring across the board. Overall, by

³ The reverse direction of this relationship, namely the *positive* effect of electoral fragmentation on the level of government spending, was explored by Persson et al. (2007) via the effect of coalition governments. Their claim was that “*more fragmented party systems [associated with a larger incidence of coalition governments] induce higher spending than less fragmented ones*” due to more intense electoral competition inside the coalition. Hence, one should expect that coalition governments (high fragmentation) go hand-in-hand with excess government spending and, perhaps, larger deficits. While this argument is certainly appealing, empirical evidence does not seem to unanimously support this claim. Certainly in the case of Greece the excess government spending and accumulated debt cannot be attributed to the incidence of coalition governments as the country was exclusively governed by single-party governments since 1974.

documenting empirically the mechanism (patronage) through which government spending is related to electoral fragmentation and by providing a case-study from a EU member-state, we add on existing literature, which (with few exceptions) has mainly documented the operation of machine politics in developing economies with less advanced political systems (e.g., Stokes 2005; Nichter 2008; Kitschelt et al. 1999; Fox 1994; Chubb 1982). Furthermore, our work also highlights the role that institutional and financial constraints have in restraining the clientelistic nature of a party-system.

In order to make our case, we rely on models of *redistributive* (Larcinese et al. 2014; Kriner and Reeves 2012; Cox 2009; Dixit and Londregan 1996) and *machine politics* (e.g., Gans-Morse et al. 2014, Pop-Eleches and Pop-Eleches 2012; Golden and Picci 2008; Nichter 2008; Stokes 2005; Kitschelt et al. 1999; Cox and McCubbins 1986; Chubb 1982). We briefly discuss some of them in the following section.

1.2 Related Literature

The impact of public spending in increasing electoral support for political parties has been studied both within and outside the context of clientelist (machine) politics. The role of political machines (clientelist parties) in getting out the vote and securing electoral support has been extensively documented, especially with reference to developing countries. So far, scattered through the literature are empirical evidence (e.g., Gans-Morse et al. 2014; Pop-Eleches and Pop-Eleches 2012; Nichter 2008; Stokes 2005; Kitschelt et al. 1999; Fox 1994; Chubb 1982; Wilson and Banfield 1963) that *political machines* might target core supporters (e.g., Cox and McCubbins 1986) and swing voters (e.g., Stokes 2005; Dixit and Londregan 1996) alike, either via “pork-barrel” spending, government hand-outs and in-kind transfers or by offering access to various social services and public sector jobs (e.g., Robinson and Verdier 2013; Nichter 2008; Stokes 2005) in order to get their vote. More recently, the important role of electorally motivated public spending in securing electoral support for dominant parties have received renewed attention in the context of advanced industrialized democracies as well (e.g., Larcinese et al. 2013; Matakos and Xefteris 2013; Kriner and Reeves 2012).

In particular, Kriner and Reeves (2012) explore the influence of federal spending on US Presidential elections. They study Presidential elections from 1998 to 2008 and they find that voters tend to reward parties (and their presidential nominees) for increased federal spending in their communities.

Furthermore, they find that this relationship is stronger in swing-states, something that resonates well with previous theoretical findings on targeted spending on swing voters (e.g. Dixit and Londregan 1996). Hence, they conclude that “although voters may claim to favor deficit reduction, presidents who deliver such benefits are rewarded at the ballot box.”

In the same vein, Larcinese et al. (2013) test a model of redistributive politics using exit-poll data from US elections. They only find modest support for the conjecture that politicians will favor financially their core constituencies. Yet, as they note, their findings “[...] might reflect features of distributive politics that are particular to the US” and in particular the federal structure of the American government that places multiple checks and balances to political actors. As a result, “[t]he President may have relatively little influence over the distribution of federal expenditures. Perhaps, even though he would like to target [...] voters, he cannot.” It is exactly this notion of constraints, institutional or otherwise, which are present in most advanced democracies that our model wants to highlight as important determinants of party-system fragmentation and political power-sharing.

In the context of less advanced party-systems, Stokes (2005) provides an extensive account on machine politics with an application to Argentina. Stokes finds strong evidence that machine parties target poor voters and among them especially those whose support is in doubt. That is, instead of targeting their core constituencies, as most formal literature suggests (e.g., Dixit and Londregan 1996) she finds that machine parties target those swing voters that are the most vocal.⁴ In the same vein, Golden and Picci (2008) examine “whether [...] ruling parties direct spending to core or marginal electoral districts” and find that districts that elect officials from the governing (dominant) parties receive more public money, as those politicians possess greater political resources and can reward their core constituencies by directing more pork in their districts. In another related essay, Pop-Eleches and Pop-Eleches (2012) provide empirical evidence on machine politics from Romania. They find that “incumbents can buy political support through targeted public spending” as the beneficiaries of government hand-outs “were significantly more likely to support the incumbent parties.” Finally, Gans-Morse et al. (2014) provide a formal framework to evaluate different varieties of clientelism and analyze the strategies that machine (clientelist) parties employ in order to achieve their targets. The main difference of those studies with this paper is the following: we are not solely interested in the re-election probability of the incumbent; rather we are interested in identifying the structural effects of imposing exogenous constraints on the opportunistic behavior of machine parties and on the overall allocation of electoral and political power within a party-system.

⁴ As Stokes points out (2012, pp. 316) the selection method of her Argentine operatives is “to help the people who complain the most, the ones who say, ‘What are you going to give me?’”

In the section that follows, we first develop our theoretical mechanism in more detail and we explain how we can use the information shock in order to get identification. Then, in section 3 we present our econometric estimation model and the main results. Section 4 concludes.

2. Constraining the Political Machines: The Case of Greece

The choice of Greece as a case study is ideal both for methodological and theoretical reasons. First, we can exploit the action of the Greek government to fiddle the books (underreport the deficit figures for 2005-2008) and the subsequent retrospective revision by Eurostat as a natural experiment (information shock) that altered voters' expectations on future government "pork-barrel" spending. Moreover, throughout its recent political history (1974-2012), Greece has been exclusively governed by stable single-party governments led by one of the two dominant parties (either the centre-left *PASOK* or the centre-right *Nea Dimokratia*), thus strengthening our argument that the causal relationship is reversed.⁵ Finally, the Greek party-system is characterized by its clientelistic nature and its strong patronage linkages (e.g. Elcock 2008; Kostis 2005; Koliopoulos 1997; Mouzelis 1996; Petmezas 1990; Lyrintzis 1987; Petropoulos 1968) both at the national and (especially so) at the local levels. In the sections that follow we elaborate on each of these points separately.

[INSERT FIGURES 2 AND 3 ABOUT HERE]

2.1 The Information Shock: Timing of Events

In this section, we present a brief account of the events that took place between the two electoral contests (2009 and 2010) in order to illustrate the nature of the information shock and how we can exploit this retrospective revision in order to get identification.⁶ The sequence of events is as follows:

1. August 2009. The conservative Greek Government [*Nea Dimokratia*] calls for early elections scheduled for October. The main reason was that the 2009 deficit, previously forecasted at 5%, was significantly revised upwards (projected to exceed 10%) by the Bank of Greece.⁷

⁵ Moreover, observe that the massive expansion of government spending and the accumulation of deficits occurred during the period from 2005-2009 under the single-party government of the centre-right *Nea Dimokratia* party (ND). In fact, as Figure 2 demonstrates, the first-ever coalition government that was formed in the aftermath of the 2012 legislative elections is associated with a significant reduction in government spending. This implies that higher electoral fragmentation was an outcome of the 2010 debt crisis, not its causal factor.

⁶ In Figure 3 (Appendix A) we present a summary of those successive, retrospective revisions of the government's accounts.

2. *September 2009*. Eurostat publishes the results of the fiscal audit and revises upwards the 2009 deficit estimates by almost 9% (approximately 13.8%). Following this first revision, elections take place right afterwards (October 2009) and the then-incumbent centre-right *Nea Dimokratia* [ND] government (in office since April 2004) is largely defeated in the polls by the main challenger, the other dominant party, the centre-left *Pan-Hellenic Socialist Movement* [PASOK], which gained the absolute majority of seats in the Greek Parliament and formed a single-party government.⁸ Yet, electoral fragmentation remained at previous low levels and the two dominant parties got a joint 80% of the vote (very close to their historical average). Moreover, there was no differential impact across regions with high and low public sector size (see Fig. 1.a).

3. *May 2010*. A second revision is published by Eurostat. This new audit, covering the period from 2005 and onwards, is conducted in collaboration with EU's statistical agency *Eurostat*.⁹ According to the new estimates the deficit in 2009 soared at 15.5% (1.7% more than anticipated, mainly due to measurement error). More interestingly, the audit revealed that the government's budget deficit for the period 2005-2008 has been systematically under-reported by the previous centre-right *ND* government. In comparison with the previous estimates (September 2009), the overall revision (for the 2005-2008 period) is an astonishing 23%.¹⁰ Moreover, 9% of this revision is *solely* attributed to the concealed deficit from FY 2006 alone. In *October 2010*, the revised Eurostat report is finalized (see Fig. 3).

4. *November 2010*. Elections take place. The incumbent centre-left PASOK (in office since October 2009) does not pay a heavy price at the polls for the fiscal misdeeds of the previous centre-right *ND* administration. As a result, it wins convincingly the mid-term elections, securing 8 out of 13 regional gubernatorial posts (including the Athens Metropolitan region with more than 3 million registered voters) and almost all major municipalities. Yet, electoral fragmentation rises to a new high (up to 69% from 65% within a year) and support for the two dominant parties reached a then-historic low.

⁷ The Bank of Greece confirmed in September 2009 that the FY 2009 deficit will most likely exceed 13%.

⁸ PASOK won the 45% of the popular vote and 160 out of 300 seats in the Parliament.

⁹ In fact, this was the first time that *Eurostat* accepted the report of the Greek statistical agency ELSTAT “without any reservations.”

¹⁰ One might wonder what part of this 23% revision is due to measurement error (as is the case for the 1.7% upward revision of the 2009 deficit which was also reported in May 2010) and what is attributed to deliberate under-reporting. While some part of this retrospective 2005-08 revision is undoubtedly attributed to measurement error, the sheer magnitude of the increase makes this a very unlikely possibility. Measurement error cannot simply account for such a large revision (almost 9%) for a single year (2006). By looking at Figure 3, one can get an idea of the relative magnitude of the measurement error by comparing the differences between the two previous reports (May and September 2009) concerning the years from 2005 to 2008. Therefore, even if some measurement error exists in this report (May 2010) as well, the magnitude is most likely to be of the same order as before.

2.2 Main Mechanism and Theoretical Framework

The reason that we can exploit this *retrospective* revision as an *information shock* is that the actual deficit figures for 2005-2008 were concealed by the Greek authorities and were only uncovered by Eurostat retrospectively, prior to the November 2010 elections. Hence, in the period from November 2009 to October 2010, while information concerning the current economic situation remains virtually unchanged,¹¹ new information concerning the real size of the 2005-2008 budget deficits becomes available (see Fig. 3). Since this retrospective revision concerns deficits that were incurred mainly in 2005 and 2006, but were not reported, it is clear that this additional increase in government debt between these two electoral contests cannot be attributed to policies followed by the newly elected PASOK administration during the last couple of months. Rather, it is attributed to the disclosed information that *both the voters and the markets* previously ignored (see Fig. 4).¹² Hence, this revision was a pure information shock that changed expectations over the government's ability to engage in extensive pork-barrel spending and rent distribution in the future. That is, not only was Greece ruled by a single-party government since 1974, but on the top of it, it was *information* about past, not current, fiscal performance that triggered this change in voters' expectations. This shift in expectations over future rents, caused by new information, allows us to address any concerns over reverse causality and identify the effect of expected government spending on fragmentation.

[INSERT FIGURE 4 ABOUT HERE]

In this particular context, where the two big machine parties (*PASOK* and *ND*) dominated the political landscape¹³ establishing a very extensive clientelistic network, the politicians supported by those parties apart from policy proposers also constitute centers of clientelistic networks (Elcock 2008). That is, prior to each election candidates make promises regarding the size and composition of their network. Obviously, these promises depend upon the size of the “pork” that they can attract from the central government which, in turn, depends: a) on how much pork there is available; and b) on how

¹¹ The report of May 2010 is almost identical with that of September 2009 concerning its estimates for the 2009 budget deficit and its projections for 2010.

¹² As further proof to this claim, observe the evolution of the spread in the yield between the Greek and the German 10-year bonds (Fig. 4). In the months preceding the October 2009 election, when information regarding the pre-existing but concealed budget deficits was not yet publicly known, the spread was less than 200 base-points and in fact it was declining. It spiked in May 2010, when new information regarding past deficits became publicly available.

¹³ The two dominant parties, *PASOK* and *Nea Dimokratia* ruled uninterruptedly since 1974, taking turns in office (*PASOK* for 20 years and *ND* for 17 years). In Appendix B, we present more information on the institutional and political context of Greece.

well connected the local candidate is with the central government.¹⁴ Hence, candidates supported by the two big parties enjoy an advantage compared to all other candidates. They tend to be better connected with central government and as evidence shows (see e.g., Golden and Picci 2008) they can attract more pork to their districts, thus making their promises of distributing rents to the voters more credible compared to other competitors. As a result, they were able to attract more votes (see e.g., Stokes 2005) and their vote share was significantly higher (and fragmentation was lower) than what would have otherwise been, if those voters were to make their decision solely based on ideological terms in the absence of those transfers.

Nevertheless, after the revelation of new information and the resulting foreign fiscal monitoring from the Troika, their promises lost credibility. That is, the information shock acts as an exogenous fiscal constraint placed by the markets that limits the ability of dominant parties to credibly promise more electorally motivated government spending and rents. As a result, rent-seeking voters, who used to vote for the two machine parties, are now anticipating that the central government will have less pork available for distribution as expected spending cuts will reduce the size of rents and public sector employment.¹⁵ Therefore, the advantage that dominant parties and their candidates enjoyed as compared to others was eliminated. Thus, support for dominant parties is also expected to drop (and electoral fragmentation is expected to rise) relatively more in the patronage-intensive (high public sector) regions that are the ones most affected (see also Hicken 2011).

But, why should rent-seeking voters abandon those parties and why should fragmentation increase by more in those regions that the allocated pork used to be larger than others, especially since other candidates cannot credibly promise more?¹⁶ The answer is simple: assume that the central government cuts by half the pork allocated to two regions. If in one region the before-cuts allocated pork was one billion euros (and could finance a large clientelistic network) while in the other region it was just one million (and can hence finance a very small network) then the electoral effect of the cut should be dramatic in the first region while in the second one it should be negligible. That is, in this context of

¹⁴ Notice that local elections occur every 4 years while the average duration of a government is much shorter (due to early elections). In addition, until 2010 *PASOK* and *Nea Dimokratia* were the only parties that rotated in government during the tenure of any elected local official which implies that only the candidates supported by one of the two dominant parties could credibly promise to deliver “pork” to their electoral clientele.

¹⁵ For instance, the Loan Agreement between the Greek government and the Troika imposed a 1 to 5 (later 1 to 10) replacement ratio in public sector jobs and a sharp reduction in government spending.

¹⁶ One legitimate concern is that candidates regions with bloated public sector might have more lobbying power. That is, the size of the public sector might be endogenous to their bargaining power. Thus client-voters might be less afraid that the cuts would affect them, which would produce the opposite effect. We will address this (and other) concerns in the next section by considering the regions which experienced the highest growth rate of public sector employment in the period 2000-2008 but did not historically have high levels of public sector employment.

multi-dimensional electoral competition (where the first dimension is social ideology and the second is the size of rents)¹⁷ the reduction in the size of pork that can be distributed in the first region reduces the importance of the clientelistic network and increases the salience of the traditional dimension. In that respect, “client-voters” are now “liberated” from their dependence on pork. This implies that their electoral behavior resembles more to that of the voters in the second region: it is now driven relatively more by the traditional social ideology dimension.¹⁸ Hence, those voters who abandon the dominant parties do so not because the other parties have something more to offer but because their voting behavior is now determined to a greater extent by their social ideology. As a result, (*ceteris paribus*) electoral fragmentation is expected to decline by more in those regions. In the section that follows, we develop a very simple model that spells-out in a more formal way the theoretical arguments presented above.

2.3 A Parsimonious Model of Multi-dimensional Choice

To fix ideas further, assume that each region is characterized by the level of public money –“pork”– that they receive. In any such representative region, candidates run for office. The space of electoral competition is bi-dimensional. That is, there is one non-monetary (e.g., social ideology) and one monetary (transfers) dimension. In the first dimension (non-monetary), candidates’ platforms are assumed to coincide with the platforms of the parties they are affiliated with. Candidates, apart from social ideology, are also free to promise transfers to individuals or to groups of voters (job and project contracts, targeted public facilities, etc.) in order to get their votes (Stokes 2005). In a centralized state where all transfers depend on central government, the effect of these promises on the electoral support of each candidate obviously depends on three factors: (i) on the health of the central government finances, (ii) on previous allocation of funds to that region, and (iii) on the “ability” of the candidate to attract funds from the central government which depends on her partisan identity. It is hence straightforward that candidates who are supported by governing parties (present or future) are better connected with those who control pork-barrel transfers and can attract more pork-barrel spending in order to reward their clientele (Golden and Picci 2008).

¹⁷ This framework of two-dimensional preferences where one dimension is social ideology is very common in the literature and has been extensively utilized in the past (e.g. Anesi and Donder 2009; Krasa and Polborn 2010, 2012, 2013; Groseclose 2007; Dziubiński and Roy 2011; Matakos and Xefteris 2013).

¹⁸ This idea that voters “trade” social ideology (non-monetary dimension) for monetary benefits (e.g., rents or public sector jobs) has been documented in the literature and is explored in greater detail in Krasa and Polborn (2013) and Matakos and Xefteris (2013).

In the case of Greece, which certainly fits the description of a centralized state (see also Appendix B), we observe that a) from 1974 until 2010 Greece only experienced single-party governments of *PASOK* and *ND* and b) during each of the two most recent local administrations electoral terms (2002-2006, 2006-2010) both *PASOK* and *ND* governed the country for at least a year each.¹⁹ That is, candidates in local elections supported by *PASOK* and *ND* could more credibly make transfer related promises compared to other candidates. For a comprehensive description of the role of local authorities in Greece and their manipulation by party interests see Elcock (2008).

Following the literature on multi-dimensional electoral competition (e.g., Anesi and Donder 2009; Groseclose 2007; Krasa and Polborn 2010, 2012 and 2013; Dziubiński and Roy 2011; Matakos and Xefteris 2013) we consider the following specification. Voters in each region have symmetric single-peaked preferences on a one-dimensional social ideology space (say the $[0,1]$ segment) but at the same time they also receive utility from direct transfers (in the form of rents).²⁰ Their ideal policies are distributed uniformly on the policy space. Formally, a voter with ideal policy i derives utility:

$$U_i(p_J, t_J) = -|i - p_J| + t_J,$$

if a candidate who is supported by a party J with social ideology platform p_J is elected and promises a transfer of size t_J from the central government to the region (this can be thought of as the average or else as the per capita transfer towards a representative voter). In line with these assumptions consider, for expositional simplicity, a four candidates specification such that $J \in \{L, PASOK, ND, R\}$ and that $t_{PASOK} = t_{ND} > t_J$ for every $J \in \{L, R\}$. Moreover, assume that each candidate J is arranged on the segment $[0, 1]$ such that $p_L < p_{PASOK} < p_{ND} < p_R$. To analyze this situation and compute how each party's vote shares varies with t_J and p_J one needs to identify the voter i who is indifferent between voting for candidate L and *PASOK*, between *PASOK* and *ND* and finally, between *ND* and R .²¹

¹⁹ Moreover, the electoral power of the two parties was on average equal as was the overall time they have spent in office (11 years for *PASOK* -from October 1994 to April 2004 and from October 2009 to November 2010- and 9 for *ND* -from).

²⁰ In fact this formulation of preferences is identical to what Groseclose (2007) calls “one-and-a-half dimensional preferences” where voters have single-peaked preferences in the one dimension and homogenous preferences in the second one (more money is better for every voter irrespective of her ideal point).

²¹ Formally, for a voter i to be indifferent between voting for two candidates J and K , such that $p_J < p_K$ the following condition must be satisfied:

$$U_i(p_J, t_J) = -|i - p_J| + t_J = -|i - p_K| + t_K = U_i(p_K, t_K)$$

In turn, this implies that the indifferent voter is given by: $i_{J,K} = \frac{p_J + p_K}{2} - \frac{(t_K - t_J)}{2}$

Then, by indifference and $t_{PASOK} = t_{ND}$ we have that:²²

$$i_{L,PASOK} = \frac{p_L + p_{PASOK}}{2} - \frac{(t_{PASOK} - t_L)}{2} \quad (1)$$

$$i_{PASOK,ND} = \frac{p_{PASOK} + p_{ND}}{2} - \frac{(t_{ND} - t_{PASOK})}{2} = \frac{p_{PASOK} + p_{ND}}{2} \quad (2)$$

$$i_{ND,R} = \frac{p_{ND} + p_R}{2} - \frac{(t_R - t_{ND})}{2} \quad (3)$$

For expositional simplicity, we let $p_L = 0$, $p_{PASOK} = \frac{1}{3}$, $p_{ND} = \frac{2}{3}$, $p_R = 1$ and $t_L = 0$, $t_{PASOK} = \tau$, $t_{ND} = \tau$, $t_R = 0$.²³ Then, from (1), (2) and (3) above one can easily solve for the indifferent voters between L and $PASOK$, $PASOK$ and ND and ND and R which are respectively:

$$i_{L,PASOK} = \frac{1}{6} - \frac{\tau}{2}, \quad i_{ND,PASOK} = \frac{1}{2} \quad \text{and} \quad i_{ND,R} = \frac{5}{6} + \frac{\tau}{2}.$$

Then, for every $\tau < 1/3$ it is easy to show that all voters with ideal policy from 0 to $\frac{1}{6} - \frac{\tau}{2}$ prefer the candidate supported by party L to each of the other three candidates, all voters with ideal policy from $\frac{1}{6} - \frac{\tau}{2}$ to $\frac{1}{2}$ prefer the candidate supported by $PASOK$ to each of the other three candidates, all voters with ideal policy from $\frac{1}{2}$ to $\frac{5}{6} + \frac{\tau}{2}$ prefer the candidate supported by ND to each of the other three candidates and all voters with ideal policy from $\frac{5}{6} + \frac{\tau}{2}$ to 1 prefer the candidate supported by party R to each of the other three candidates.

Therefore, a straightforward computation yields the following vote shares for each candidate:

$v_L = \frac{1}{6} - \frac{\tau}{2}$, for the candidate supported by party L ; $v_{PASOK} = \frac{1}{3} + \frac{\tau}{2}$, for the candidate supported by $PASOK$; $v_{ND} = \frac{1}{3} + \frac{\tau}{2}$, for the candidate supported by ND ; and $v_R = \frac{1}{6} - \frac{\tau}{2}$, for the candidate

²² Moreover the assumption that $t_{PASOK} = t_{ND}$ can also be relaxed even though for the purposes of this study we believe that it is a fairly accurate approximation of the fact that the two dominant parties shared power and office almost equally since 1974 and had in general equal access to the public purse.

²³ Clearly this normalization of candidates' transfer proposals is without any loss in generality. One can simply assume that parties L and R offer $t_L = t_R = a$ while $PASOK$ and ND offer $t_{PASOK} = t_{ND} = \tau + a$ where $a, \tau > 0$. As long as the two dominant parties offer more than L and R (a feature that reflects their higher access to central government funds that government parties have) our results go through as presented. The same is also true if we relax the symmetry assumption with respect to candidates' positions, as long as $PASOK$ and ND remain the two largest parties in terms of vote shares received and have symmetric access to the public funds (that is, $t_{PASOK} = t_{ND} > t_J, \forall J \in \{L, R\}$). That is, as long as $p_{PASOK} < 1/2 - p_L$ for $p_L \in [0, 1/4)$ and $p_{ND} > 3/2 - p_R$ for $p_R \in (3/4, 1]$ our results still go through without any complication since by eq. (2) it is clear that the indifferent voter between the two big parties will not vary with the proposed level of public spending.

supported by party R . Hence, the cumulative vote-share of the candidates supported by $PASOK$ and ND is given by:

$$V_{PASOK+ND} = 2/3 + \tau,$$

In turn, the Rae (1968) index of electoral fragmentation is given by:

$$F = 1 - v_L^2 - v_{PASOK}^2 - v_{ND}^2 - v_R^2 = \frac{13}{18} - \frac{\tau}{3} - \tau^2.$$

We can now perform a comparative statics analysis and see what would happen to electoral fragmentation if t_J , for $J \in \{PASOK, ND\}$ were to decrease by a fraction $s \in (0,1)$. That is, $t'_J = \tau(1 - s)$. In such a case the cumulative vote-share of the candidates supported by $PASOK$ and ND would become:

$$\tilde{V}_{PASOK+ND} = 2/3 + \tau(1 - s),$$

Also, electoral fragmentation would become:

$$\tilde{F} = \frac{13}{18} - \frac{\tau(1-s)}{3} - [\tau(1 - s)]^2.$$

Therefore the change in the cumulative vote-share of these two candidates (after the announcement level minus before the announcement level) would be:

$$\Delta V_{PASOK+ND} = \tilde{V}_{PASOK+ND} - V_{PASOK+ND} = -\tau s < 0$$

Similarly, the change in the levels of the electoral fragmentation (after the announcement level minus before the announcement level) would be:

$$\Delta F = \tilde{F} - F = \frac{1}{3}\tau s[1 + 3\tau(2 - s)] > 0.$$

Notice that a) fragmentation increases when promised transfers decrease (that is when s increases), b) the cumulative vote-share of the candidates supported by $PASOK$ and ND decreases when promised transfers decrease and most importantly c) *the absolute value of each of these changes is increasing in τ* . That is, the larger the value of τ (size of transfers before the announcement of the cut) the larger the increase (decrease) that will be observed in the degree of electoral fragmentation (cumulative vote share of the candidates supported by $PASOK$ and ND).

Given that the pre-cut size of public sector transfers τ is directly analogous to the intensity of patronage linkages in that specific region (see e.g., Keefer 2005; Hicken 2011), our results suggest that patronage-intense (high public sector) regions will be impacted *relatively* more from those cuts. The intuition should also be clear. In those low public sector regions (regions with low initial τ) dominant parties did not rely a lot on those transfers in order to get additional votes and voting behavior was mostly driven by voters' preferences in the second (non-monetary) dimension. Hence, the effect of a spending cut on their vote shares (and fragmentation) is negligible. Contrary to that, in the high public sector regions dominant parties relied heavily on those transfers to get a relatively larger amount of additional votes since voters who were otherwise relatively more inclined (on social ideology grounds) to vote for either party L or R would now rather vote for them. Obviously, when those transfers are reduced the relatively more distant voters abandon the dominant parties not because other parties can offer them more rents but because in absence of sizeable transfers the social ideology component of their preferences (e.g., immigration, religion and race) dominates their choice. Thus, spending cuts have a relatively greater impact in those regions where voting behavior was mostly driven by rent-seeking rather than ideology.

To see this point more clearly, we provide a stylized example. Assume that there are only two regions (one high and one low public sector respectively) such that in the first one $\tau_1 = 0.1$ whereas in the second $\tau_2 = 0.2$. That is, the size of the public sector is twice as much in the second region. Then a straightforward computation reveals that in the first region $V_{PASOK+ND}^1 = 0.767$ whereas in the second one we have $V_{PASOK+ND}^2 = 0.867$.²⁴ That is, the two dominant parties get an extra 10% of the vote in region 2. Now consider what happens if there is a 50% cut in those transfers in both regions (that is, $s_1 = s_2 = 0.5$).²⁵ As before one can calculate the post-cut cumulative vote shares in both regions and see that $\tilde{V}_{PASOK+ND}^1 = 0.717$ while $\tilde{V}_{PASOK+ND}^2 = 0.767$.²⁶ That is, even though the two dominant parties still receive a larger share of the votes in the second region as compared to the first one, their cumulative vote share has decreased *differentially* by 5% more in region 2.

²⁴ That is, in region 1 the indifferent voter between L and $PASOK$ will be closer to L (it will be at 0.116 when $\tau_1 = 0.1$ whereas it will be at 0.066 when $\tau_2 = 0.2$ (and analogous computation is true for the indifferent voter between ND and R who will be relatively closer to R in region 1). Obviously since $t_{PASOK} = t_{ND}$ the indifferent voter between ND and $PASOK$ will always be at $1/2$.

²⁵ Obviously our argument is strengthened if one assumes that the size of the spending cuts was larger in high public sector regions (that is, $s_1 < s_2$) as it was actually the case.

²⁶ Observe that now in region 2 the indifferent voter between L and $PASOK$ moves *relatively more* to the right (from 0.066 to 0.116) whereas in region 1 the indifferent voter who was more to the right initially (pre-cut) moves *relatively less* (from 0.116 to 0.142).

Moreover, notice that the fact that the change in fragmentation is increasing in τ does not imply that all rent-seeking voters will abandon those parties. Neither does it imply that the number of rent-seeking voters who support those parties in the high public sector regions is *smaller* in absolute terms than those who support them in the low public sector ones, as it is still the case that the two dominant parties get more votes in the high public sector regions. But, in relative terms, their vote shares decrease by a larger proportion and electoral fragmentation increases by more. In figure 5 we present this result graphically. It is clear that fragmentation increases in both regions as spending cuts become deeper (when s is increasing). This corresponds to our first hypothesis. In addition, observe that for any given level of cuts $s \in (0,1)$ the increasing in fragmentation is larger the larger the size of pre-cut transfers τ was. This corresponds to our second hypothesis (the differential increase of fragmentation in high public sector regions).

[INSERT FIGURE 5 ABOUT HERE]

3. Data and Identification Strategy: Going NUTS

In this section, we formulate and test our two hypotheses. Our first hypothesis is that expected government spending cuts caused an increase in electoral fragmentation in 2010. That is, the causal link runs from economic to political outcomes. Second, we identify the mechanism through which this effect operates (patronage and protest voting) and we hypothesize that the impact of those expected cuts (operating via the above mechanism) should be more pronounced on those patronage-intense (high public sector) regions. That is, the increase (decrease) in fragmentation (support for dominant parties) should be relatively larger there, since voters expect fewer rents from the machine parties as a result of the cuts. Moreover, by documenting this differential increase in electoral fragmentation we are also able to disentangle the effect of our proposed mechanism from that of simple economic or performance (accountability) voting (see e.g., Kiewiet 1983; Kinder et al. 1983) which we expect to be uniform across regions, as evidence seem to suggest (see Fig. 6.a and 6.b). In the following section, we briefly describe our data and estimation model.

[INSERT FIGURE 6.A & 6.B ABOUT HERE]

3.1 Data Description and Estimation Model

We organize our data at the regional (NUTS) level.²⁷ The data on regional electoral fragmentation are own calculations using official electoral data from the Greek Ministry of Interior that are publicly available. Electoral data in our sample are collected from 2007 to 2012. This includes four electoral races (three legislative in 2007, 2009 and 2012 and one regional in 2010).²⁸ We have also supplemented our data with a series of economic and socio-demographic indicators which were retrieved from Eurostat's online regional database and LFS survey (2014) and the Euro-barometer Surveys (data on trust).²⁹ We split the regions into two groups: those with public sector size above the national average and those below. From the 48 regions, 22 are classified as High Public Sector regions (quasi-treatment group), while the remaining 26 are the control group. We also employ two alternative specifications: one with continuous treatment effects and another where we split the regions based on the growth rate (not the overall share) of public sector employment from 2000 to 2008. Tables 1 and 2 present the summary statistics for those two groups.

[INSERT TABLES 1 & 2 ABOUT HERE]

3.1.1 Dependent Variable: Electoral Fragmentation

Before presenting our econometric model we first describe how we have constructed our dependent variable. Formally, we measure electoral fragmentation at the regional (NUTS-3 and NUTS-2) levels according to the index proposed by Rae (1968) as:

²⁷ NUTS stand for *Nomenclature Unitaire de Territoire Statistique* and are the basic Eurostat-used unit for reporting regional statistics. There are three regional sub-divisions: NUTS-1 (North and South), NUTS-2 (13 regions) and the smallest possible sub-unit NUTS-3 (48 regions).

²⁸ In previous versions of the paper we have also included electoral data from the 2006 regional elections in our estimation. As it can be easily verified the results one gets once those observations are added do not differ significantly (neither in their direction nor in their magnitude) from those results presented in this version of the paper. Nevertheless some of the control variables that we consider important (e.g., migration rates) are only available from Eurostat (at the NUTS-3 level) from 2007 and onwards. Hence, since our results do not differ significantly we decided to go forward with the specification presented above. Moreover, in our placebo regressions (Table 6) we use electoral data dating back to 2002.

²⁹ The survey asks questions on trust over various institutions. The two relevant questions that we have retrieved data for are: "Do you trust the government" and "Do you trust the political parties." The survey does not report aggregate data for the following three regions due to small sampling base: Aegean, Ionian and West Macedonia.

$$F_{it} = 1 - \sum_n (v_{nit})^2,$$

where v_{nit} is the vote share of a party/candidate n , in region i , at electoral term t . Moreover, we also employ an alternative dependent variable: the sum of the vote shares of the two dominant parties, *PASOK* and *ND*. While previous literature (e.g. Persson et al. 2007) has solely relied on the Rae Index to measure electoral fragmentation there are good reasons why one would like to use this alternative dependent variable. Since electoral fragmentation is an aggregate variable, it can still vary when voters switch their choice between the two dominant parties. Suppose for instance that some fraction of the *ND* voters (the incumbent dominant party in 2009) have decided to *punish* the incumbent (perhaps because it fiddled the books) by voting mainly for the main challenger *PASOK* (the other dominant party) while few others chose to vote for smaller parties. This should also increase fragmentation but such an “accountability” story is a bit mechanical. Therefore, it is neither very interesting nor surprising. That is, the aggregate electoral fragmentation index is not immune to such mechanical explanations.

On the other hand, our identification strategy is based on a totally different mechanism. Our claim is that rent-seeking voters have abandoned *both* dominant parties in expectation of less “pork due to the information shock. Hence, in order to rule out such mechanical explanations, we repeat all our estimates using the sum of vote shares of the two dominant parties (*TOP-2* as we call it).³⁰ This alternative variable is completely insensitive to vote swaps between the two major parties, thus successfully addressing the concerns raised above regarding the mechanical part of the “accountability” story. Such vote swaps will be fully ignored by our variable that only records the *net* voter diffusion from *both* big parties towards the minor ones. This leaves us with only two other competing (to our *patronage* and *rent-seeking*) mechanisms: *protest* and *economic* (or *performance*) voting. We take up on them in the section following the presentation of our results.

Finally, in order to further insulate our estimates we take one additional step in the way we operationalize the measurement of our dependent variables. We sum the vote shares of *rebel candidates*³¹ together with those ones of their mother-parties for the 2010 (post-shock) elections. As a

³⁰Note that in this case the coefficients of interest are expected to have the *opposite* sign (i.e. to be negative), as increased support for both dominant parties implies lower electoral fragmentation and vice versa. In fact, our new dependent variable (*TOP-2*) is the mirror image of electoral fragmentation.

³¹All major parliamentary parties officially endorse candidates for each regional electoral competition (in most of the cases those candidates are high-profile party members). Sometimes, intra-party factions who want to express disagreement against party leadership and policies may defy official candidates by contesting the race as rebel candidates. We measure their vote shares separately in the 2006 and 2002 local elections (when we use them for our placebo regressions in Section 3) but we group them together in 2010.

result, we underestimate (overestimate) electoral fragmentation (the sum of vote shares of the two big parties) in 2010.

3.1.2 Econometric Model

In order to test our hypotheses, we estimate a standard *Differences-in-Differences* model.³²

$$F_{it} = \beta_0 + \beta_1 * (POST)_t + \beta_2(HIGH\ PUB.\ SECTOR * POST)_{it} + \gamma_i + \mathbf{X}'_{it} + \varepsilon_{it} \quad (4.a)$$

where *POST* is a dummy variable taking the value of 1 for all the post-information shock periods (i.e. for 2010), *HIGH PUB. SECTOR * POST* is the interaction dummy, \mathbf{X}'_{it} is the set of other controls and γ_i are region dummies (fixed effects).³³ The coefficients of interest are β_1 and β_2 . They capture the effect of the information shock (less expected “pork”) and its differential impact on high public sector regions, respectively. We expect both of them to be positive when electoral fragmentation is our dependent variable (and negative when we replace electoral fragmentation with the sum of the vote shares of the two dominant parties).

One concern over our identification strategy is related to the nature of the information shock and how to identify the *net effect* of spending cuts. While we address successfully the issue of reverse causality, by the means of the natural experiment, there might still be some worry over the fact that in the months between November 2009 (post-2009 elections period) and October 2010 (pre-2010 elections period) in addition to expectations about the size of future rents, other things that could potentially affect electoral fragmentation (and support for dominant parties) might have changed as well.³⁴ While this is certainly not true for some variables, such as educational attainment, urbanization levels and other socio-demographic characteristics that affect voting behavior but are almost impossible to change within eleven months, the same cannot be argued for economic variables (e.g. unemployment, income, migration rates) or perceptions and sentiments. As a result, anything else changing in those

³²We also estimate a version of equation (4) where we replace electoral fragmentation with the sum of the vote shares of the two dominant parties (PASOK and ND) as our dependent variable. That is, we estimate:

$$V_{it}^{PASOK+ND} = \beta_0 + \beta_1 * (POST)_t + \beta_2(HIGH\ PUB.\ SECTOR * POST)_{it} + \gamma_i + \mathbf{X}'_{it} + \varepsilon_{it} \quad (4.b)$$

³³ In some specifications we estimate a simple fixed effects (*xtreg*) model without the region dummies γ_i , but with the inclusion of the *HIGH PUB. SECTOR* dummy variable indicating a *High Public Sector* region.

³⁴ In fact, our coefficient of interest β_1 is the coefficient of a time dummy and not of the change in expectations regarding government spending *per se*.

eleven months, and positively correlated with government spending cuts³⁵ would bias the effect of expected spending cuts on electoral fragmentation upwards.³⁶ Therefore, in order to account for those variables that might change in the period under consideration we have decided to include in our regressions a vector of controls \mathbf{X}'_{it} which includes variables such as: unemployment, income per capita, migration and a dummy variable controlling for incumbent re-election. Moreover, in some specifications we interact the control variables with the *HIGH PS* dummy in order to account for the possibility that some variables might have a differential impact on high public sector regions.

In addition to the steps taken above, we also estimate our model using population weights for each region. But instead of using the number of registered voters, we weight our sample using the number of voters who turned out in the 2010 elections.³⁷ This ensures that the metropolitan region of Athens, the region that exhibited the biggest increase in fragmentation in 2010, is deliberately under-represented in the sample.³⁸ Secondly, in some specifications we completely exclude this region to account for heterogeneous, unobservable demographic characteristics (e.g. urbanization and education levels) that allow voters to acquire and process information regarding the economic situation faster. The general idea of all these steps is to be very conservative in estimating the increase (decrease) in electoral fragmentation (support for dominant parties) for the 2010 election, especially for the *high public sector* regions. If we can still get statistically significant, large in magnitude and positive coefficients on the *POST* and the *HIGH PS*POST* variables then, this would imply that the effect we are capturing is important. In addition to the specification in equation (4) we also estimate a model with continuous treatment effects. That is, we replace the *HIGH PS* dummy variable with the variable that was originally used to construct it: the actual size of the public sector, measured by the size of public sector employment as in Hicken (2011). Formally, we estimate the following equation:³⁹

$$\Delta F_{i,t} = \alpha_0 + \beta_1 POST_t + \beta_2 F_{i,t-1} + \beta_3 Public\ Sector\ Size + \gamma_i + \mathbf{X}'_{it} + \xi_{it} \quad (5)$$

where $\Delta F_{i,t} = F_{i,t} - F_{i,t-1}$.

³⁵ For example the expectation of spending cuts might have caused discontent to voters or might have reduced the level of trust they have on the big parties as a result of past fiscal misdeeds.

³⁶ Note that most socio-demographic variables (e.g. education, urbanization etc.) are slow-moving and cannot change radically within months. Hence, much of their impact is picked-up by the fixed effects estimator.

³⁷ The rationale is to account for changes in fragmentation and support for dominant parties caused by relatively lower turnout in some regions. We elaborate more on this in the next section.

³⁸ Athens accounts for the 30% of registered voters but only for the 20% of overall turnout. In fact, fragmentation in Athens alone increased by 15% more than the national average. Given that 30% of voters are registered in Athens, this indicates the magnitude of underestimation that we impose on the coefficients.

³⁹ We also estimate a variant of equation (5) where, as before, we replace $\Delta F_{i,t}$ with $\Delta V_{i,t}^{PASOK+ND}$ as our dependent variable, where $\Delta V_{i,t}^{PASOK+ND} = V_{i,t}^{PASOK+ND} - V_{i,t-1}^{PASOK+ND}$.

Clearly, at least in the two-election models (that is, when $t = 2010$) this specification is exactly equivalent to the standard difference-in-difference specification in (4) and allows the estimation of continuous intensity to treatment effects. Therefore, we should also expect $\beta_3 > 0$ (and $\beta_3 < 0$ when we replace electoral fragmentation with the sum of the vote shares of the two dominant parties). Finally, in order to check the common trends assumption we estimate a series of placebo regressions where we move exposure to treatment (information shock) two electoral periods into the past using data from elections prior to 2007 (that is, from 2006, 2004 and 2002).

3.2 Results: Two-Election Sample (2009-2010)

Tables 3 to 5 present the estimates of the above models using the small sample (2009 and 2010 elections). In Table 3, we estimate a simplified version of the model without the inclusion of the interaction term *HIGH PS*POST* in order to verify our first hypothesis: the positive (negative) effect of the information shock on electoral fragmentation (on the cumulative vote shares of the two dominant parties). Under all alternative specifications, expected government spending cuts (the coefficient on the time dummy) caused a 3-5 percentage point increase in fragmentation across all regions or a 4-6 percentage point decline in the vote shares of the two dominant parties. Moreover, the coefficients are statistically significant at least at the 5% level and always have the expected signs. Moreover, in columns 4 and 8, the exclusion of Athens Metropolitan region from the regressions does not change our estimates significantly.

[INSERT TABLE 3 ABOUT HERE]

In Table 4, we present the results from estimating equation (4) on the small sample (with two elections, 2009 and 2010, and without the use of lead and lag terms) under various alternative specifications. In columns 1 to 4 our dependent variable is *Electoral Fragmentation* while in columns 5 to 8 we replace it with the sum of vote shares of the two dominant parties (*TOP-2*) for the reasons presented in detail before. Under all specifications, the two coefficients of interest are *positive* (*negative* for the case of *TOP-2*) and statistically significant even at the 1% level. In Columns 1-2 and 5-6 we estimate equation (4) using a simple fixed effects estimator (with no controls and no region dummies) in order to test our second hypothesis: the differential impact of those cuts on high public sector regions (less expected rents weakened the patronage links which in turn imply less support for clientelist parties). In Columns 3-4 and 7-8 we include additional controls as a robustness check and

also in order to control for unemployment, income and migration which may have changed over the course of those eleven months and might be driving the effect. We find no such evidence.

[INSERT TABLE 4 ABOUT HERE]

Moreover, as we can observe from Columns 3-4 and 7-8 almost all of the documented increase (decrease) in fragmentation (support for dominant parties) in Table 3 is attributed to the differential impact that expected cuts had in the *high public sector* regions. That is, electoral fragmentation (support for dominant parties) rose (decreased) differentially by almost 5 percentage points. This finding further enhances our point on the reverse link and also on our proposed causal mechanism. Hence, even though the coefficient on “expected cuts” β_1 is a time dummy, leaving open the possibility that something else might have changed during that period, the fact that trust moved in parallel across the two regions (see Fig. 6.a and 6.b) while fragmentation changed *differentially* makes it very unlikely for trust or any other type of performance and accountability arguments to be driving this effect. If one adds to that the fact that we have found no evidence that other economic variables (that also vary over time) can explain this effect, we are left with the conclusion that the single most plausible explanation that can account for the differential impact on high public sector regions is our patronage mechanism.⁴⁰ It is clear that the accountability (performance) or protest voting stories cannot explain this differential decline in the vote shares of the two dominant parties in the 2010 elections.⁴¹

[INSERT TABLE 5 ABOUT HERE]

In Table 5 we present the estimates of our model using the continuous values of the variable that measures the size of the public sector (intensity of treatment variable).⁴² Again, one can observe that the results we are getting are not substantially different from those presented in Tables 3 and 4, even though we use a continuous measure of the intensity of clientelistic linkages (the share of public sector employment in each region). All our estimates are statistically significant at any conventional level. Moreover, our coefficient estimates are large in magnitude which implies that they are also politically and economically relevant: on average dominant parties experienced an additional 6

⁴⁰ In the section that follows we will also address additional concerns over our proposed mechanism by eliminating a series of other alternative mechanisms and by introducing an additional way of identifying patronage-intense regions.

⁴¹ We will later show that unlike the 2010 elections, where the main mechanism is patronage, in 2009 and 2012 accountability (performance) and protest voting appear to be the more prominent ones.

⁴² As in Table 2, the size of the public sector is reported at the NUTS-2 level. In Table A.1 we also estimate equation (4) at the NUTS-2 level for the whole sample (2002-2010).

percentage point decline in their electoral support in a region whose public sector size is one standard deviation above the mean. That is, our estimates in Table 5 are almost identical with those in Table 4.

[INSERT TABLE 6 ABOUT HERE]

Finally, in Table 6 we present the results of our placebo estimates where we apply the treatment to past voting outcomes (in the 2004 and 2006 elections) in order to establish that the parallel trend assumption is satisfied.⁴³ As it can be seen, in all the specifications, the coefficients on the interaction terms *High Public Sector*2006* and *High Public Sector*2004* fail to be statistically significant at any conventional level, thus confirming our identifying hypothesis of the parallel trend of electoral fragmentation (and support for dominant parties) across high and low public sector regions.

3.3 Identification Revisited: Addressing Competing Mechanisms

While our findings so far provide some strong evidence in favor of our hypotheses, in this section we provide further conclusive evidence that will help us rule out any competing alternative explanatory mechanisms such economic or protest voting. Initially, we focus on *protest voting* and trust which was briefly discussed in the section above. We take several steps to address such concerns. First, we collect data on trust (both towards the government and the party-system at large) in order to identify whether trust changed differentially across the two groups of regions in 2010. As Figure 6 shows, we find no evidence for that.⁴⁴ In fact, trust declines in parallel across the two groups of regions (there is no differential effect) while electoral fragmentation (and support for dominant parties) change differentially (see Fig. 9). Hence, (lack of) trust for the political parties cannot explain the observed pattern.

[INSERT FIGURES 9.A & 9.B ABOUT HERE]

Second, we extend our model to cover four electoral races (we use data from the 2007 and 2012 elections). This allows us to estimate a version of equation (4) where we also include treatment leads (anticipatory effects) and lags (post-treatment effects) in order to account for pre-existing trends and

⁴³ In Table 6 (columns 3-4 and 7-8) we also present the placebo regressions for the alternative identification strategy that we introduce in Section 3.3.

⁴⁴ If anything, trust is slightly higher in high public sector regions in November 2010 elections which should drive the effect in the opposite direction (less fragmentation not more).

make sure that the effect we are picking up in 2010 is indeed attributed to the information shock (and the expectations for less “pork”) and not some other source of variation. We also introduce electoral year dummies (λ_t) to account for time-specific trends.⁴⁵

Moreover, by extending our analysis to include the May 2012 elections, where trust towards dominant parties and government collapsed (see Fig. 6.a and 6.b), we can disentangle the impact that these two effects had. Given that Greece continued to be shut-off from the financial markets in 2012 as well, the information and the resulting expectations regarding the ability of *PASOK* and *ND* to engage in clientelistic spending have not been revised or updated. Therefore, if our mechanism (that the information shock changed expectations on future rents thus causing fragmentation to rise more in certain regions in 2010) is accurate, then one should expect that there should be no such gap in fragmentation (support for dominant parties) between the two groups in the election prior to the treatment (2007) while in the election following the treatment (2012) the gap that was observed in 2010 has to be of equal magnitude, in the absence of new updated information. The reason is that, as we claim, the 2010 information shock is unique and its effect on the support for dominant parties (fragmentation) operates via the rent-seeking mechanism in those patronage-intense regions. Therefore, even if an increase (decline) in electoral fragmentation (support for dominant parties) was observed prior to or after the 2010 elections, it should have *no differential effect* across regions. This is exactly what we intent to document by estimating a version of the model with leads and lags.

In Table 7 we present our estimates when we employ the expanded four-election sample (which contains additional electoral data from the 2007 and 2012 legislative elections). This allows us to introduce treatment lead (for 2007 and 2009) and lag (for 2012) terms. In practice, it allows us to determine whether such a differential change in the support for dominant parties (or electoral fragmentation) has also occurred in the past. If our identification strategy (information shock) and the link via which it operates are accurate then all the coefficients on the interaction (lead and lag) terms should fail to be different from zero, in a statistically significant way. We find that the effect of the increase (decrease) in fragmentation (support for the two dominant parties) in 2010 is accounted for almost exclusively by the differential increase in the high public sector regions (NUTS-3). Nevertheless, this is not the case for 2012, where the significant decline of more than 30 percentage points (increase of more than 20 p.p.) in the support for the two dominant parties (in fragmentation)

⁴⁵ Formally, we estimate the following model:

$$F_{it} = \beta_0 + \beta_1 * (POST)_t + \beta_2(HIGH\ P\ S * POST)_{it} + \sum_{\tau=-q}^{-1} \delta_{\tau} D_{i\tau} + \sum_{\tau=1}^m \delta_{\tau} D_{i\tau} + \lambda_t + \gamma_i + \mathbf{X}'_{it} + \varepsilon_{it} \quad (4.c)$$

where $D_{i\tau}$ is a dummy for high public sector regions and electoral periods and treatment occurs in period $\tau = 0$.

that was recorded does not vary differentially across the two groups of regions. Clearly, this further decline (rise) in support for the two dominant parties (fragmentation) observed in the 2012 elections is mainly attributed to the decline in trust. Yet, the effect we document in 2010 is solely due to our information story as the *accountability* (economic performance) or the *protest* voting story cannot account for the differential change across regions that we *only* observe in 2010 (but not in 2012 or 2009). Therefore, while the decline (increase) in support for dominant parties (fragmentation) in 2009 and 2012, by 3 and 40 percentage points respectively, is statistically significant and can certainly be attributed to more mechanical accountability stories (e.g., voters sanctioning bad economic outcomes or expressing disappointment for both big parties) or even protest voting (for example against the *ND* government that fiddled the books in 2009), this is cannot be the case for 2010. On the one hand, protest or accountability voting stories, as evidence in columns 1-4 (Table 7) shows, are not associated with differential changes in the patterns of electoral support for *PASOK* and *ND* across the two groups of regions. On the other hand, in 2010 the increase (decrease) in fragmentation (support for dominant parties) is fully accounted by the differential change across the two groups of regions (note that the coefficient on the term *HIGH PS*2010* is always statistically significant even at the 1% level under any specification). That is, the differential effect that we document is unique to the 2010 elections. Thus, it can only be explained by the information shock operating via the patronage mechanism as we suggest.

[INSERT TABLE 7 ABOUT HERE]

An additional explanatory mechanism that also needs to be examined is one that is closely related to that of *economic voting*. That is, the differential increase in fragmentation in those high public sector regions might simply reflect the discontent of some voters (e.g., civil servants) who are unhappy with economic performance of the government, especially when it comes to their individual finances.⁴⁶ Hence, it is likely that civil servants punish the government (and perhaps both dominant parties) for reducing their benefits or salaries. In such a case, as the number of public employees is larger in those high public sector regions (see Table 1) the effect that we find, even after controlling for changes in per capita income, might still be –at least partially– a result of standard economic voting behavior. In order to address those concerns, and also highlight the indispensable role that our mechanism plays in explaining this effect, we use an alternative method to identify patronage-intense regions: we use the growth rate of public sector employment. In order to identify the patronage-intense regions, instead of

⁴⁶ While no civil servant was fired prior to the 2010 election, in the period following Greece's entry into the bail-out mechanism (May-November 2010) some groups of public employees saw their salaries being cut.

using those regions with the *highest levels* of public sector, we use regions that experienced the *fastest growth* in public sector employment from 2000 to 2008.

The rationale is as follows. Recall that the fiscal derailment that occurred in 2005-2008 (see Fig. 1) was mainly due to a large expansion of public employment, mostly in the form of fixed, short-term, renewable job contracts. As those who got hired in that period represent the more recent clientele of two big parties, there should be the ones that are mostly affected by the prospect of less “pork” in the future (e.g. their fixed-term employment contracts might not be renewed).⁴⁷ Hence, we can identify the regions that will be affected the most by the reduction in clientelistic rents by splitting the sample into two groups along those lines. Since our main identifying hypothesis is that fragmentation increased differentially in some regions because “voter-clients” abandoned the big parties in anticipation of fewer rents, we can re-estimate equation (4) using the regions that experienced the highest *growth rate* (from 2000 to 2008) in this type of public employment. This way, we can identify with greater precision⁴⁸ the regions with the most recent beneficiaries of this clientelistic surge and who are more likely to abandon the dominant parties in anticipation that it is less likely that their job contracts will be renewed (less rents). At the same time though, some of those *high* (public sector) *growth* regions did not have high *levels* of public sector employment in 2010 (see Tables 1 and 2). In fact, in 2010 the share of public sector in terms of overall regional employment in those high growth regions was identical to the low ones (21% versus 20%), while in terms of *overall* share of public sector employment, high growth regions account for only the 30% (and low growth regions account for the remaining 70%). Hence, if simple economic voting was taking place, then the observed effect should be absent or even reversed when we estimate this model. Moreover, this alternative identification strategy further eases any additional concerns over endogeneity.⁴⁹

⁴⁷ This is a legitimate assumption to hold, given the particularities of the Greek legal system and Courts which have ruled that even if a public employee was initially hired for a fixed-term period, if her contract is renewed for a successive amount of times, she can remain in the public sector indefinitely as long as her duties and position covers a “permanent need” of the state, which is to be decided by the Court. Hence, most recent clients are more likely to be affected by and react to those expected cuts (see also Appendix B for more details).

⁴⁸ We need to stress here that strong patronage links might still exist in regions that had traditionally very high public sector employment but were not the champions in this surge in public employment from 2005 to 2008. Such examples are the metropolitan areas of Athens and Thessaloniki. Thus, it makes sense to use both identification techniques as a robustness check and compare the results. As we show in the next section, results do not vary significantly.

⁴⁹ Obviously the assignment of regions into two groups (regions with high/low size of public sector) is not perfectly random. Even though the two groups do not seem to differ a lot in any observable dimension other than the size of public sector (see Table 1) this could be a potential source of worry. High public sector regions might also have other unobservable characteristics that can also be associated with government spending and electoral outcomes via a mechanism other than our own (patronage). An example could be that high *levels* of public sector might also be a proxy for greater lobbying power. Hence, this alternative identification strategy

In Table 8, columns 1 to 4 present the results of estimating this version of the model (column 5 reproduces the estimates of column 3 in Table 4 to act as a benchmark). A thorough inspection of all the coefficients reveals that the general picture remains virtually unchanged. While the magnitude of the main coefficient of interest *HIGH PS*2010* is slightly smaller in absolute terms (support for dominant parties declined by 3.2-3.8 as opposed to 3.5-4.5 percentage points) it is still significant at the 5% level and statistically indistinguishable. The same is also true for β_1 , which is negative and identical in magnitude (-1.9). Again, the coefficients on all lead and lag terms (columns 3-5) are statistically indistinguishable from zero, implying that the differential change in our dependent variable is uniquely associated with the 2010 elections and information shock operating via our proposed mechanism. If other more mechanical stories (e.g. accountability, trust, protest or economic voting) were taking place, we should have observed a gap appearing in 2009 (accountability story) and further widening in 2012 (due to economic voting or trust).

[INSERT TABLE 8 ABOUT HERE]

Finally, one might be concerned on how relevant is to compare legislative (2007, 2009 and 2012) with regional elections (2010). Despite the fact that evidence shows that electoral fragmentation in regional elections follows an identical pattern with legislative ones (see Fig. 7 and 8) and, in fact, regional elections are a good proxy for mid-term elections, we still need to present our argument in greater detail. First, let us clarify that we do not need such a strong assumption to hold (that regional elections are a proxy to legislative ones) for our identification to be valid. Rather, we need something weaker: it suffices that electoral behavior between regional and legislative elections does not vary *across* these two groups of regions (high and low public sector).⁵⁰ Since our main identifying hypothesis is that our mechanism caused a *differential* change in electoral fragmentation across high and low public sector regions, it suffices to show that such a differential change is not driven by the fact that the 2010 elections were regional ones. Clearly, this is true as evidence presented before shows (see e.g. Fig. 7, 8 and 9). Moreover, as the results of our placebo regressions indicate (Table 6, columns 1-4) when we move treatment into the 2006 regional elections, the parallel trends assumptions is satisfied. While

allows us to address such concerns as high growth regions do not differ (in a statistical sense) from the low growth ones in terms of the size of the public sector.

⁵⁰ Note that there seems to be *no significant difference* between regional and legislative elections in that respect. For example the presence of rebel candidates or joint-support tickets does not appear to be a characteristic that is solely observed in certain high public sector regions. Moreover, the fact that voters might take into account other factors (e.g., a candidates origin or constituency that used to be active) when they vote in local elections does not compromise our identification strategy either, as long as these voting behavior patterns are uniform and are not only present in certain regions (e.g., high public sector regions).

issues such as *rebel* or independent candidates, joint-support candidacies, local issues dominating the agenda or the candidate's constituency of origin were always prevalent in local elections and (to a certain degree) important determinants of voting behavior, they did not seem to vary differentially across high and low public sector regions. That is, we do not observe this gap being an outcome of the regional nature of the electoral competition. Otherwise this pattern should have also been observed during past regional electoral contests (e.g., in 2006 regional elections). Yet, we find no such evidence (see Table 6).

[INSERT FIGURES 7 & 8 ABOUT HERE]

Nevertheless, in addition to the evidence presented above and the steps we thoroughly presented in Section 2 (e.g., concerning rebel candidates), we present some additional evidence in support of our claim here. First, if one observes the political discourse and the issues raised during the 2010 regional elections it becomes evident that the whole campaign was dominated by issues of the national (e.g., the bail-out agreement) rather than the local agenda. Second, the 2010 elections were the first regional elections that took place at the periphery (NUTS-2) level. This implied that the vote had a more national than local flavor compared to previous local elections. As a testament to this, the number of non-affiliated or joint-party candidacies was one of the smallest in the history of local elections.⁵¹ Finally, in addition to all the above, in order to control for the variability in the party-support patterns for each candidate, we estimate a modified version of our econometric model in equation (4) where we control for two additional characteristics: whether a candidate enjoyed the joint-support from more than one party and also the NUTS-3 (*Nomarchia*) constituency where a politician used to be politically active in the past (what we call constituency of origin) before standing as a candidate at the *Peripheral* elections.

[INSERT TABLE 9 ABOUT HERE]

⁵¹ Out of the 92 candidates (in 13 regions) only 5 where joint tickets between two parties and only 4 were independents who did not enjoy the formal support by any of the major political parties represented in parliament at that time (*PASOK*, *Nea Dimokratia*, *SYRIZA*, *Communist Party of Greece*, *Populist Orthodox Rally*, *Democratic Left* and the *Greens*). More than 90% of all candidates were single-party support candidates and with 6-8 candidates standing for election in each region all the major parliamentary parties were represented in each region. As far as the two dominant parties are concerned, *PASOK* had no joint-support candidacy with any other party apart from one region (joint with the *Populist Orthodox Rally*) while *ND* had only 3 joint-support candidacies (again with the *Populist Orthodox Rally*) in three very small regions (Ionian islands, North and South Aegean islands) jointly comprising less than 7% of the electorate. Finally, all major political parties (including the two dominant ones) had officially endorsed a candidate in each of those 13 regions.

In Table 9, we present those estimates. Consistent with our story, and after controlling for any joint-candidacy and constituency origin effects, our results show that both dominant parties suffered a *differential* decline in their vote shares in those high public sector regions of approximately 4 to 6 percentage points (the coefficients on *HIGH PS*2010* are negative, ranging from -4 to -5.4 for *PASOK* and from -4.2 to -7.5 for *ND* respectively). Moreover, while the main opposition party of *ND* seems not to be losing any (or in fact even winning some) votes overall, in those high public sector regions its decline in electoral support is *identical* with that of *PASOK*. This might be a surprising finding if one tries to interpret solely based on accountability (trust) or economic voting stories but is very consistent with our mechanism. Rent-seeking voters are abandoning both dominant parties as they anticipate that less “pork” is available for them. Hence, the differential effect that we document is not due to an accountability or economic voting mechanism, rather it exists despite their (potential) presence.

3.4 The Rise of a New Dominant Party?

On a final note, there is an additional structural element that sounds a note of caution for our identification strategy and needs to be addressed. As the May 2012 electoral results reveal, perhaps what we witnessed in 2010 was just the beginning of the “new” Greek party-system and the rise of a new dominant party, *SYRIZA*.⁵² As a result, one might assume that the decline in vote shares of the two dominant parties in 2010 was just the prelude of this effect. This would have been problematic for our identification strategy. Since our goal is to establish that the increase in fragmentation in 2010 was due to rent-seeking voters abandoning the dominant parties (that had access to “pork”) for smaller ones (that did not have), we want as few structural parameters as possible varying in the period prior from May 2010 to the November elections. And while our claim is that this rent-seeking mechanism is an important determinant of voting behavior in 2010, we do not want to go as far as arguing that our findings document the collapse of the “old party-system.” If a “new party-system” emerged in 2010 then, it would have been difficult to identify which are the dominant parties in a party-system under transition. That is, how can we identify whether rent-seeking voters did in fact abandon the dominant parties or whether they simply switched to a new emerging dominant party?

⁵² In the May 2012 election the Coalition of Radical Left [*SYRIZA*] emerged as a major political player, almost tying in first place with *ND* (20%), leaving the once dominant *PASOK* in third place (with 16%).

In order check this claim, we treat *SYRIZA* as a dominant party not only in the 2012 but also in the 2010 elections and we re-estimate our model in equation (4) by using a new dependent variable: *TOP-2* plus *SYRIZA* vote shares. We present those estimates in Tables 7 (columns 5 and 6) and 8 (columns 6-8). We find no evidence supporting the claim that the effect in 2010 is driven by the emergence of *SYRIZA* as a dominant party. If that was the case, then after adding the vote shares of *SYRIZA* the coefficient on the interaction term *HIGH PS*2010* should have been statistically indistinguishable from zero. Instead, what we observe is that the results that we obtain in columns 5 and 6 (Table 7) are almost identical in magnitude with columns 3 and 4 (a minor change from -3.5 to -3.8). Similarly, in line with our previous results, all the other lead and lag terms (and especially the interaction term *HIGH PS*2012*) are not statistically different from zero (compare Column 4 with 6), which implies that this alternative story cannot explain neither the overall change nor the differential increase of fragmentation in high public sector regions.⁵³ In fact, it is clear that while support for dominant parties collapsed in 2012 (even if one includes *SYRIZA*'s vote shares in the analysis the magnitude is about 26 percentage points) the difference between high and low public sector regions that was observed in 2010 (and which, by *conservative* estimates, is approximately 4 percentage points) is maintained almost intact in 2012 (see also Fig. 9).

3.5 Additional Competing Mechanisms: A Final Note

In the previous section of the paper, we have already addressed some of the most pressing threats to the validity of our identification strategy. We have also examined three alternative mechanisms (accountability, economic and protest voting) that could potentially explain our finding of a differential decrease in the support for dominant parties in patronage-intense regions. Yet, by presenting a series of arguments, robustness checks and modifications in our econometric model, we have ruled them out as possible explanations to our findings.⁵⁴ Moreover, declining trust *cannot*

⁵³ There is a *single* exception in column 7 (Table 8), when we use the sum of votes of the two dominant parties (*PASOK* and *ND*) plus *SYRIZA* as our dependent variable where the coefficient on the lag term *HIGH PS*2012* is now positive (5.75) and significant at the 5% level (compare Columns 4 with 7). Nevertheless, the coefficient on the interaction term *HIGH PS *2010* is again identical. But this finding is, in fact, consistent with our story of rent-seeking voters abandoning dominant parties as one has to take into account that *SYRIZA* promised to hire an extra 100,000 civil servants during the 2012 elections campaign. Hence, it came as no surprise that voters who are more likely to lose their jobs are the first to abandon the old dominant parties for a party that promises to maintain (and even generate more) public sector jobs.

⁵⁴ In fact, we see that in 2009 as well there was also a statistically significant, yet smaller, increase in fragmentation. Consecutive misleading estimates over the 2009 deficit might have caused voters to lose trust in

account for the differential change across regions, as trust moves in parallel over the whole period under consideration (see Fig. 6).⁵⁵ In addition to these concerns, we have also addressed some other more “mechanical” stories that could run against our main mechanism (rent-seeking). Finally, as a robustness check, we have also utilized an alternative identification strategy (growth rate of public sector employment in 2000-2008 instead of levels) in order to strengthen our mechanism.

Nevertheless, there are some additional competing mechanisms that we would like to address in this section. One such alternative story is related with decreased turnout in the 2010 elections which appears to have dropped more in what we have categorized as *high public sector* regions. Then, this implies that the increase in fragmentation (decrease in dominant parties vote shares) might not be an outcome of rent-seeking voters abandoning those parties in expectation of less spending and rents, rather it can be the case that some of their past voters, frustrated and angered with those parties systematically lying about the true status of the economy, decided to abstain from the polls. In such a case the increase in fragmentation and the decline in the *vote shares* of those parties might be an outcome of this *alienation* and *discontent* story. Fortunately, we can account for this by using weights in our regressions that depend not on the number of *registered* voters but on the number of *actual* voters who turned up in the polls in 2010. As a result of our choice of weights, regions that experienced relatively lower turnout (and especially the high public sector ones) are significantly under-weighted in the sample. Therefore, plausible as it may be, this story cannot drive our empirical results.

There is a final set of competing stories that we need to consider before concluding the discussion. Suppose for instance that regions with a large public sector had voted for the *ND* party in higher numbers in the past and thus abandoned it in higher numbers too, once they realized that it had deliberately misreported the fiscal data. So, some of them might have abandoned it in 2009 while most of them did so in 2010. This explanation would also produce the observed effect of increased fragmentation (reduced support for dominant parties). Nevertheless, as evidence shows this is not the case as support for the *ND* party was not particularly higher in those regions. In fact, support for *ND* in high public sector regions was standing on average (2009-2010) at 36%, as opposed to 38% in the remaining regions. Hence, the above story does not seem very plausible. Perhaps an alternative story is that such regions benefited from the fiscal cheating by the *ND* government disproportionately and

both big parties and vote for the smaller ones. But we find a *differential effect* across regions only in 2010, neither in 2009 nor 2012.

⁵⁵ If anything, trust in political parties and the government is slightly higher in high public sector regions which strengthens further our argument.

do not want to abandon them that easily, which would go against the observed effect. While this might sound plausible, evidence do not seem to support this claim either, as electoral support for *ND* in those regions reached an all-time low of 35% in 2010 (until of course the 2012 elections). Moreover, the regions that benefited the most from cheating are not those ones with the highest *level* of public sector employment but those with the highest *growth rate* over that period. In fact, this is exactly what we control for in the estimates presented in Table 8.

4. Discussion and Concluding Remarks

Our findings go beyond the point of simply reversing the causal link between electoral fragmentation and government spending. By pinpointing the mechanism (*patronage* and *political clientelism*) that is responsible for this differential change in those patronage-intense regions, our study uncovers the critical role that machine politics and rent-seeking play in determining electoral outcomes. Thus, our work helps us to better understand some recent findings about Greece's exceptional case of economic hysteresis with respect to other EU member states (see e.g., Campos et al. 2014). Our findings clearly point to a political economy explanation of this phenomenon: the important role of transparency and inclusive (non-clientelistic) political institutions in achieving better economic and political outcomes. The political and economic significance of our results lies in the above statement. By quantifying the impact of our mechanism we were able to show the relative importance of clientelism and patronage in Greek politics. According to our estimates, the electoral effects of rent-seeking and *machine politics* are instrumental. We have found that one in six voters that has abandoned the two big parties in 2010 did so for purely opportunistic reasons as a result of anticipating less "pork." Of course, this is not to say that all other possible mechanisms (such as protest voting, performance voting, accountability, polarisation, trust etc.) that affect voters' behavior in the Greek context are not relevant determinants of electoral support. Rather, what we find and document is that an important part of the electorate (even though not the majority) is actually driven by the distribution of "pork." This fraction of voters is large enough in order to play a pivotal role in an electoral contest and thus it can be instrumental in determining the outcome of an electoral process.

Moreover, while the collapse of the old status-quo in Greece in 2012 was clearly an outcome caused by more than one parameter, by focusing on the 2010 elections, we have managed to disentangle the electoral effect of the two main mechanisms (patronage/rent-seeking and trust/accountability). Thus, we were able to show that the weakening of the once powerful clientelistic linkages was an important

factor that contributed, together with other factors, in the gradual collapse of the old two-party-system, a process which started in 2010 and was completed in the 2012 elections. Additional channels, then, had an additive impact on the extreme fragmentation of the party-system that was recorded in May 2012 which was also marked by the rise of many extremist parties. But, this does not diminish the role that our documented mechanism has played.

Furthermore, by disentangling the two main mechanisms through which the financial crisis impacted upon electoral outcomes we can shed some light on the determinants of the success of those radical parties. In that respect our findings suggest that, in addition to those “traditional” channels (e.g., trust and voter disaffection, accountability and performance voting) that are responsible for the observed rise in the electoral support of more extremist (leftist or rightist) parties, there might also be a significant institutional aspect to this political phenomenon. Hence, the consequences of more fragmentation can potentially have more long-lasting effects which might persist even when the financial crisis is over. Thus, in light of the recent rise of populists and radical parties all over Europe our results can provide an insight for some of the reasons behind their emergence, success and electoral consolidation. Yet, this current study does not aspire to have such a broad scope and on that note, we defer those important questions for future research.

Finally, our findings yield more support to the link between controls on governments and the dispersion of electoral and political power among parties (Acemoglu and Robinson, 2012). Clearly, the financial crisis in 2010 placed an exogenous constraint on machine politics and the ability of dominant parties to distribute more pork-barrel spending. This, in turn, undermined the position and the political power that the “old” dominant parties enjoyed. Hence, our work highlights the importance of constraints (fiscal or institutional) in limiting the prevalence of machine politics and in reshaping the structure of the party-system.

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Table 1: *SUMMARY REGIONAL STATISTICS FOR HIGH & LOW PUBLIC SECTOR REGIONS.*

Variables	Level of Public Sector		Public Sector Growth Rate	
	High (Treatment) (1)	Low (Control) (2)	High (Treatment) (3)	Low (Control) (4)
Income p.c. (in PPS)				
Level in 2010	17,700	18,395	17,790	18,333
Average (in 2006-2010)	18,657	18,433	17,945	19,136
Level in 2000	12,172	11,003	11,576	11,550
Education Level (2010)				
Secondary (%)	36.7	35.9	36.4	36.2
Tertiary (%)	22.1	16.1	19.4	19.2
Public Sector Employment (% of total regional employment)				
Share in 2010	23.0	17.4	21.3	20.0
Average Share (2000-2008)	25.0	20.1	22.4	23.0
Growth Rate from 2000-2008 (in %)	24.5	17.5	32.3	11.8
Overall Employment (in 2010)				
Employment (in 1,000s)	3,378	1,011	1,326	3,063
Share (%) of total employment	77.0	23.0	30.0	70.0
Unemployment Rates (in %)				
In 2010	8.2	7.6	7.8	7.9
Average Rate (2001-10)	8.3	7.7	7.7	8.2

Note: *Data on educational attainment are taken from ELSTAT (Greek Statistical Authority) Population Census (2011). Data on regional unemployment (NUTS-3 level), income and public sector employment statistics are taken from the Eurostat Online Regional Database (April 2014) and LFS Survey (2014). Income is measured in Harmonized PPP. Public sector employment is given as a share of total employment. Data on employment sectoral composition at the NUTS-3 level are only available until 2012. Data on educational attainment extend until 2011.*

Table 2: *SUMMARY STATISTICS OF POPULATION & PUBLIC SECTOR EMPLOYMENT AT THE PERIPHERY LEVEL*

Region (NUTS-2)	(1)	(2)	(3)	(4)	(5)
Name	Capital	Share in 2010 (in %)	% Growth (2000-08)	Population (in 1,000s)	No of NUTS-3 Regions
Thrace	Komitini	23.2	39.6	658	2
Ctr. Macedonia	Thessaloniki	20.5	16.7	1,645	7
West Macedonia	Kozani	20.0	18.3	356	4
Thessaly	Larissa	22.0	31.3	719	4
Epirus	Ioannina	21.0	13.8	385	4
Ionian Islands	Kerkira	16.2	-2.3	237	4
West Greece	Patras	20.6	27.7	700	3
Ctr. Greece	Lamia	17.0	29.6	551	5
Peloponnese	Tripoli	15.2	26.7	711	5
Attica	Athens	23.8	3.3	2,792	1
North Aegean	Mytelene	29.9	39.1	250	2
South Aegean	Rhodos	18.1	14.7	305	3
Crete	Heraklio	17.6	17.9	528	4
Greece (Total)		20.4	21.2	9,845	48

Sources: Data collected from *HELSTAT 2011 Census*, Greek Ministry of Interior and Public Administration and Eurostat's *Online Regional Database* and *LFS survey (2014)*. All data are reported at the regional level. Computation of growth rates in Column 3 is from own calculations. We measure the size of the public sector as the share of public sector employment (central government, SOE's and local government) over total regional employment. The public sector employment share levels reported in Column 2 are the regional averages for 2010. Growth rates of public sector employment are calculated for the period from 2000 to 2008. Population statistics refer to registered voters that are eligible to vote (> 18 y.o.). In total there are 22 NUTS-3 regions classified as high public sector level regions [note: from Thessaly we have excluded a single NUTS-3 region (Karditsa) for being predominantly agricultural], while there are 23 NUTS-3 regions categorized as regions with high growth rate of public sector employment (2000-08).

TABLE 3: *WEIGHTED-OLS REGRESSIONS ON THE EFFECT OF THE INFORMATION SHOCK ON ELECTORAL FRAGMENTATION AND SUPPORT FOR THE DOMINANT PARTIES: TWO-ELECTION SAMPLE (2009-2010)*

Dependent Variable	<i>Electoral Fragmentation (Rae Index)</i>				<i>Dominant (TOP 2) Parties Vote Shares</i>			
	<i>Full</i>	<i>Full</i>	<i>Full</i>	<i>No Athens</i>	<i>Full</i>	<i>Full</i>	<i>Full</i>	<i>No Athens</i>
Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post Dummy (Year 2010)	4.668 (1.473)**	5.505 (1.693)**	2.787 (0.853)**	2.537 (1.271)*	-4.946 (0.972)**	-6.396 (1.425)**	-4.339 (1.202)**	-4.179 (1.766)*
Other controls?	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Fixed effects?	Yes	No	Yes	No	Yes	No	Yes	No
Region dummies?	No	No	No	Yes	No	No	No	Yes
R^2	0.53	0.48	0.58	0.84	0.56	0.50	0.57	0.84
N	96	96	96	94	96	96	96	94

* $p < 0.05$; ** $p < 0.01$

Note: Robust standard errors clustered at the region (NUTS-3) level reported in parentheses. Other controls include: regional unemployment rates (in %), the natural log of the regional income per capita (in EU Harmonized Purchasing Power Standard terms) reported at the NUTS-3 level, regional (statistically adjusted) net migration rate (in %) and a local elections dummy. In columns 4 and 8 Athens metropolitan region was excluded from the regressions. In columns 1, 3, 5 and 7 a simple fixed effects estimator was employed using the estimation command `xtreg` (i.e. no region dummies).

TABLE 4: WEIGHTED-OLS REGRESSIONS (2009-10) ON THE DIFFERENTIAL IMPACT OF THE INFORMATION SHOCK (EXPECTED GOVERNMENT SPENDING CUTS) ON HIGH PUBLIC SECTOR REGIONS

Dependent Variable	<i>Electoral Fragmentation (Rae Index 0-100)</i>				<i>Dominant (TOP-2) Parties Vote Shares</i>			
	<i>Full sample (48 Regions)</i>		<i>No Athens</i>		<i>Full sample (48 Regions)</i>		<i>No Athens</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>POST</i> (Year 2010 dummy)	0.950 (0.560)	0.099 (1.207)	-0.920 (1.090)	0.209 (0.868)	-1.667 (0.617)**	-0.200 (1.403)	-0.142 (0.962)	-0.624 (0.953)
<i>HIGH PS</i> * <i>POST</i> (Year 2010)	5.030 (1.667)**	5.182 (1.567)**	3.876 (1.228)**	2.781 (0.998)**	-4.436 (1.151)**	-4.452 (1.173)**	-4.066 (1.152)**	-3.598 (1.192)**
Incumbent re-elected (dummy)	.-	2.888 (1.673)	2.942 (1.284)*	1.593 (1.010)	.-	-4.817 (1.811)*	-3.646 (1.085)**	-3.070 (1.149)**
Other controls?	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Fixed Effects?	Yes	No	Yes	Yes	Yes	No	Yes	Yes
<i>Adjusted R</i> ²	0.65	0.60	0.71	0.51	0.64	0.64	0.72	0.59
<i>N of Observations</i>	96	96	96	94	96	96	96	94

* $p < 0.05$; ** $p < 0.01$

Note: Robust standard errors clustered at the region (NUTS-3) level reported in parentheses. Other controls include: regional unemployment rates (in %), the natural log of the regional income per capita (in EU Harmonized Purchasing Power Standard terms) reported at the NUTS-3 level, regional net migration rate (in %), a dummy variable indicating high public sector regions and a local elections dummy. In columns 4 and 8 the Athens metropolitan region was excluded from the regressions. In columns 1, 3, 4, 5, 7 and 8 a simple fixed effects estimator has been employed using the `xtreg` command. Dominant (*TOP-2*) parties' vote-shares variable is calculated by summing the vote shares of the two dominant parties: PASOK and ND.

TABLE 5: *WEIGHTED-OLS REGRESSIONS WITH CONTINUOUS INTENSITY OF TREATMENT (PUBLIC SECTOR SIZE) EFFECTS ON ELECTORAL FRAGMENTATION AND SUPPORT FOR DOMINANT PARTIES (2009-2010)*

Dependent Variable	$\Delta_i(\text{Electoral Fragmentation})$				$\Delta_i(\text{Top-2 Vote shares})$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post dummy (at $t = 2010$)	3.345 (0.894)**	3.970 (0.798)**	5.250 (1.024)**	2.201 (1.274)§	-4.572 (1.377)**	-1.123 (2.414)	-6.603 (1.719)**	-1.628 (1.904)
Lag of Electoral Fragmentation (at $t - 1$)	-0.337 (0.063)**	-0.277 (0.075)**	-0.409 (0.094)**	-0.421 (0.183)*	.-	.-	.-	.-
Lag of Top-2 parties' vote shares (at $t - 1$)	.-	.-	.-	.-	-0.528 (0.123)**	-0.484 (0.144)**	-0.724 (0.101)**	-0.325 (0.327)
Public Sector Size	0.717 (0.177)**	0.600 (0.180)**	0.787 (0.176)**	1.330 (0.449)**	-1.211 (0.363)**	-1.208 (0.417)*	-1.592 (0.246)**	-1.686 (0.760)*
Other controls?	No	No	Yes	Yes	No	No	Yes	Yes
Fixed effects?	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.24	0.51	0.40	0.36	0.27	0.45	0.52	0.10
N	91	91	78	26	91	91	78	26

* $p < 0.05$; ** $p < 0.01$

Note: Robust standard errors clustered at the region level reported in parentheses. In columns 1 to 4 the dependent variable is the difference in electoral fragmentation (measured by the Rae index) between the 2010 and 2009 elections. In columns 5 to 8 the dependent variable is the the difference in the cumulative vote shares of the two dominant parties (PASOK and ND) between the 2010 and 2009 elections. Other controls include: regional unemployment rate (in %), the net (statistically adjusted) regional migration rate (in %) and a dummy variable indicating whether the incumbent was re-elected.

TABLE 6: *WEIGHTED-OLS PLACEBO REGRESSIONS (DATA ONLY PRIOR TO 2007 ELECTION)*

Treatment assigned to NUTS-3 regions by Dependent Variable	Placebo applying treatment in 2006				Placebo applying treatment in 2004			
	Public Sector Share		Pub. Sector Growth		Public Sector Share		Pub. Sector Growth	
	<i>Rae Index</i>	<i>TOP-2</i>	<i>Rae Index</i>	<i>TOP-2</i>	<i>Rae Index</i>	<i>TOP-2</i>	<i>Rae Index</i>	<i>TOP-2</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High Public Sector * 2006	0.791 (1.779)	-2.094 (3.433)	-.-	-.-	-.-	-.-	-.-	-.-
High Public Sector Growth * 2006	-.-	-.-	0.227 (2.024)	-0.411 (3.523)	-.-	-.-	-.-	-.-
Post 2006	0.656 (3.008)	3.842 (6.099)	0.350 (3.462)	4.037 (7.221)	-.-	-.-	-.-	-.-
High Public Sector * 2004	-1.104 (2.204)	0.430 (4.290)	-.-	-.-	-0.515 (2.574)	0.546 (5.362)	-.-	-.-
High Public Sector Growth * 2004	-.-	-.-	1.440 (2.366)	-8.041 (4.481)	-.-	-.-	1.882 (2.648)	-8.148 (5.115)
Year 2004	-0.902 (2.045)	7.061 (4.361)	-2.019 (2.161)	9.970 (5.038)	2.899 (3.525)	5.406 (8.153)	1.883 (3.541)	8.978 (7.932)
High Public Sector * 2002	-1.439 (8.986)	1.430 (17.477)	-.-	-.-	-8.803 (12.232)	-6.449 (28.303)	-.-	-.-
High Public Sector Growth * 2002	-.-	-.-	3.753 (6.846)	1.401 (14.494)	-.-	-.-	20.266 (12.871)	-4.940 (26.313)
Other controls?	✓	✓	✓	✓	✓	✓	✓	✓
Region (NUTS-3) Dummies?	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.60	0.55	0.60	0.57	0.64	0.59	0.64	0.64
N	141	141	141	141	94	94	94	94

* $p < 0.05$; ** $p < 0.01$

Note: Robust standard errors clustered at the NUTS-3 level reported in parentheses. Other controls include: the natural log of regional (NUTS-3 level) GDP per capita (in PPP terms), regional unemployment rate (in %), a dummy variable for local elections, a dummy variable accounting for incumbent re-election and electoral period (year) dummies. Athens metropolitan region is excluded from all specifications. All data are prior to the 2007 elections (that is from the 2002, 2004 and 2006 elections).

TABLE 7: WEIGHTED-OLS REGRESSIONS (FOUR-ELECTION SAMPLE 2007 – 2012) ON THE DIFFERENTIAL IMPACT OF THE INFORMATION WITH THE INCLUSION OF TREATMENT LEAD AND LAG TERMS

Dependent Variable	Electoral Fragmentation		Top-2 Parties Vote Shares		Top-2 & SYRIZA Vote Shares	
	Athens	No Athens	Athens	No Athens	Athens	No Athens
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
<i>POST</i> (Year 2010 Dummy)	-0.223 (1.236)	0.654 (0.899)	-0.539 (1.015)	-0.741 (1.038)	3.680 (1.144)**	3.483 (1.187)**
<i>HIGH PS</i> * <i>POST</i> (Year 2010)	4.785 (1.597)**	3.107 (1.062)**	-3.496 (1.101)**	-3.021 (1.256)*	-3.783 (1.185)**	-3.800 (1.427)**
Year 2012	24.502 (1.779)**	23.831 (1.549)**	-40.901 (2.076)**	-40.178 (2.071)**	-28.782 (1.805)**	-28.924 (1.842)**
Lag term (<i>HIGH PS</i> * 2012)	-2.609 (2.323)	-0.420 (1.600)	-0.167 (2.333)	-0.511 (2.486)	-0.442 (2.144)	-1.208 (2.259)
Year 2009	1.852 (0.300)**	1.897 (0.297)**	-2.575 (0.312)**	-2.491 (0.313)**	-2.290 (0.325)**	-2.351 (0.319)**
Lead term (<i>HIGH PS</i> * 2009)	-0.821 (0.510)	-1.061 (0.625)	0.458 (0.378)	0.747 (0.419)	0.218 (0.606)	0.751 (0.433)
Region Dummies?	Yes	Yes	Yes	Yes	Yes	Yes
Electoral Year Dummies?	Yes	Yes	Yes	Yes	Yes	Yes
Other controls?	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.97	0.97	0.99	0.98	0.98	0.97
<i>N</i> of Observations	192	188	192	188	192	188

* $p < 0.05$; ** $p < 0.01$

Note: Robust standard errors clustered at the region level (NUTS-3) reported in parentheses. Other controls include: the log of regional (at NUTS-3 level) income per capita (in harmonized PPS terms), the regional net migration rate (in %), a dummy variable controlling for incumbent re-election and a local elections dummy. Unemployment rates for 2012 were not yet made available by Eurostat at the regional (NUTS-3) level. Electoral Fragmentation is calculated according to the Rae (1968) index. Dominant (*TOP-2*) parties' vote shares in Col. 3 and 4 are calculated by summing the vote shares of the two parties: PASOK and ND. In Col. 5 and 6 we also add SYRIZA's vote shares.

TABLE 8: WEIGHTED-OLS REGRESSIONS ON THE EFFECT OF THE INFORMATION SHOCK ON REGIONS THAT EXPERIENCED THE FASTEST GROWTH RATE OF PUBLIC SECTOR EMPLOYMENT IN 2000-2008

Sample Size	Two-election (2009-10)		Four-election sample (2007 – 2012) with Leads and Lags					
Dependent Variable	<i>TOP-2 Vote Shares</i>		<i>TOP-2 Vote Shares</i>			<i>TOP-2 & SYRIZA Vote Shares</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>POST</i> (Year 2010 dummy)	-1.901 (0.596)**	0.608 (1.311)	-1.901 (0.693)**	0.500 (1.610)	-0.539 (1.015)	-1.901 (0.672)**	0.459 (1.484)	3.483 (1.187)**
<i>HIGH PS Growth * Year 2010</i>	-3.198 (1.345)*	-3.832 (1.388)**	-3.198 (1.566)*	-3.692 (1.686)*	-. (1.015)	-3.198 (1.517)*	-3.637 (1.594)*	-. (1.015)
<i>HIGH PS * POST</i> (Year 2010)	-. (1.345)*	-. (1.388)**	-. (1.566)*	-. (1.686)*	-3.496 (1.101)**	-. (1.517)*	-. (1.594)*	-3.800 (1.427)**
Year 2012 (dummy)	-. (1.345)*	-. (1.388)**	-43.363 (2.357)**	-44.534 (3.072)**	-40.901 (2.076)**	-29.438 (1.777)**	-30.542 (2.346)**	-28.924 (1.842)**
Lag Terms								
<i>HIGH PS Growth * 2012</i>	-. (1.345)*	-. (1.388)**	4.522 (2.639)	5.119 (2.902)	-. (1.015)	5.852 (2.245)*	5.900 (2.521)*	-. (1.015)
<i>HIGH PS * 2012</i>	-. (1.345)*	-. (1.388)**	-. (1.566)*	-. (1.686)*	-0.167 (2.333)	-. (1.517)*	-. (1.594)*	-1.208 (2.259)
Lead Terms								
<i>HIGH PS Growth * 2009</i>	-. (1.345)*	-. (1.388)**	-0.190 (0.340)	-0.178 (0.420)	-. (1.015)	-0.190 (0.329)	-0.161 (0.418)	-. (1.015)
<i>HIGH PS * 2009</i>	-. (1.345)*	-. (1.388)**	-. (1.566)*	-. (1.686)*	0.458 (0.378)	-. (1.517)*	-. (1.594)*	0.751 (0.433)
Other Controls?	No	Yes	No	Yes	Yes	No	Yes	Yes
Region Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Electoral Year Fixed Effects?	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adjusted - R²</i>	0.47	0.61	0.98	0.98	0.99	0.91	0.97	0.97
<i>N (Obs.)</i>	94	94	188	188	192	188	188	188

* $p < 0.05$; ** $p < 0.01$

Note: Robust standard errors clustered at the region level (NUTS-3) reported in parentheses. Other controls include: income per capita (in harmonized PPS terms) at the regional (NUTS-3) level, regional net migration rate (in %), a dummy variable controlling for incumbent re-election and a local elections dummy. Regional unemployment rate data for 2012 are not yet available by Eurostat. Weights are calculated based on the number of registered voters who turned up in 2010. Dominant (*TOP-2*) Parties' Vote Shares in Col. 1 and 3-5 are calculated by summing the vote shares of the two parties: PASOK and ND. In Col. 6 and 7 we also add SYRIZA's vote shares. Col. 5 and 7 are identical with Col. 3 and 6 in Table 4 (that is, the treatment group is regions (NUTS-3) with high *level* of public sector employment). Athens Metropolitan region is excluded from all specifications.

TABLE 9: *WEIGHTED-OLS REGRESSIONS ON THE EFFECT OF THE INFORMATION SHOCK ON THE ELECTORAL PERFORMANCE OF THE TWO DOMINANT PARTIES (PASOK & ND) IN 2010 ELECTIONS*

Dependent Variable	Vote Shares (in %) of:							
	PASOK			Nea Dimokratia (ND)			TOP-2 (PASOK & ND)	
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post Dummy (Year 2010)	-4.773 (1.744)***	-5.900 (1.618)***	-6.375 (0.928)***	8.119 (3.261)**	1.863 (1.898)	3.493 (1.764)*	-2.952 (1.853)	-3.080 (1.368)**
High PS * Post (Year 2010)	-5.076 (2.173)**	-5.376 (2.209)**	-3.973 (1.220)***	-7.530 (3.196)**	-4.148 (2.561)	-6.617 (2.101)***	-3.970 (2.250)*	-3.433 (1.323)**
Joint-candidacy Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Candidate's Constituency of Origin Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Controls?	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Fixed Effects?	No	No	Yes	No	No	Yes	No	Yes
Adjusted R ²	0.26	0.28	0.78	0.17	0.57	0.56	0.68	0.75
No of obs.	96	96	96	96	96	96	96	96

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Robust standard errors clustered at the region (NUTS-3) level reported in parentheses. In all specifications we include a dummy variable indicating whether the PASOK (or ND) candidate was jointly supported in the 2010 regional elections by another minor party (there were no joint PASOK-ND tickets in the 2010 regional elections) and a dummy variable indicating whether or not the PASOK (or ND) supported candidate in the election for the wider Periphery (NUTS-2) used to be politically active in (or originated from) this specific NUTS-3 constituency in the past. Additional controls include: regional unemployment rate (in %), regional income per capita (in harmonized PPS terms), regional net migration rate, a dummy variable controlling for incumbent re-election and a local elections dummy.

5. Appendix A: Figures and Tables

5.1 Figures

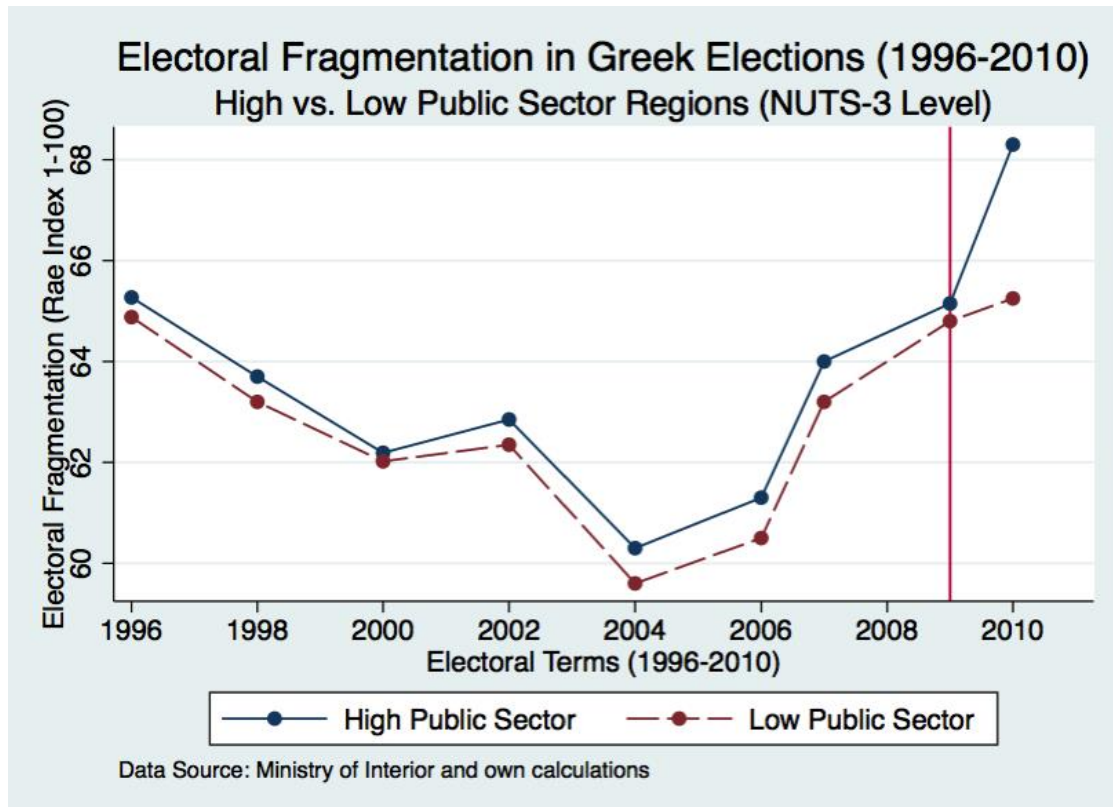


Fig. 1.a: The Evolution of Electoral Fragmentation (Rae Index) Across High and Low Public Sector Regions (NUTS-3) in Greek Elections (1996-2010).

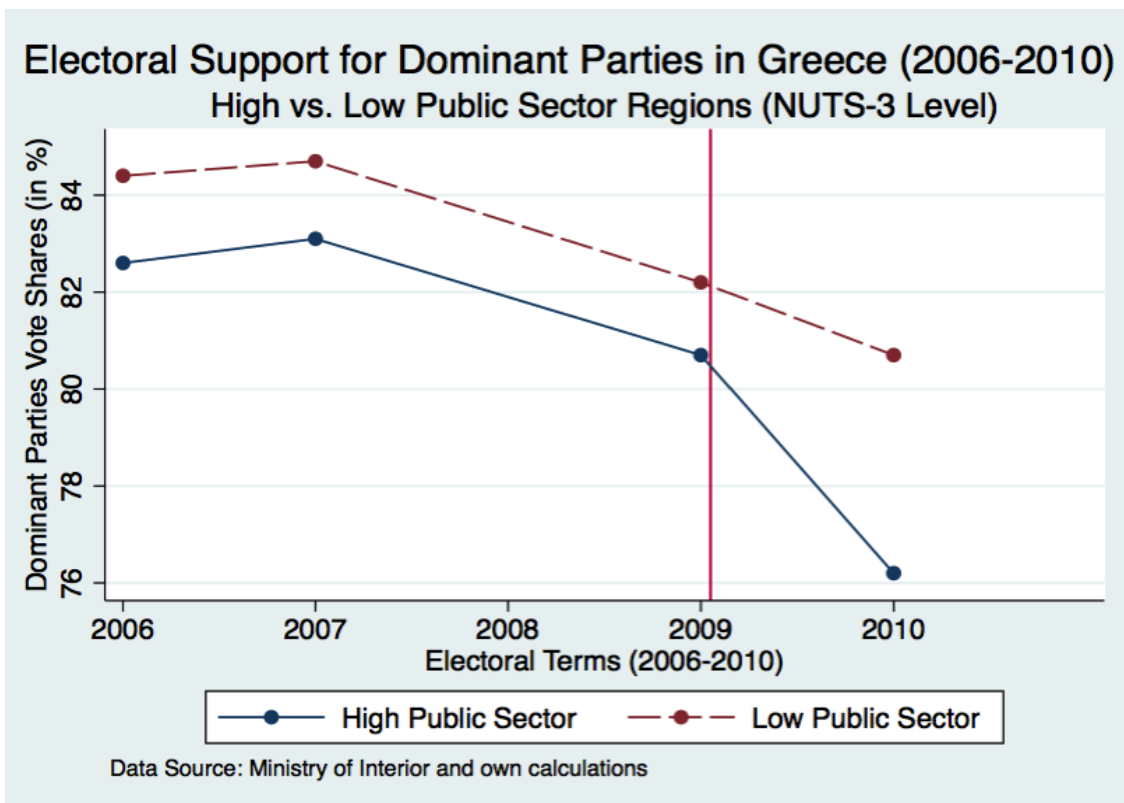


Fig. 1.b: Electoral Support (% of votes) for Dominant Parties (PASOK & ND) Across High and Low Public Sector Regions (NUTS-3) in Recent Greek Elections (2006-2010).

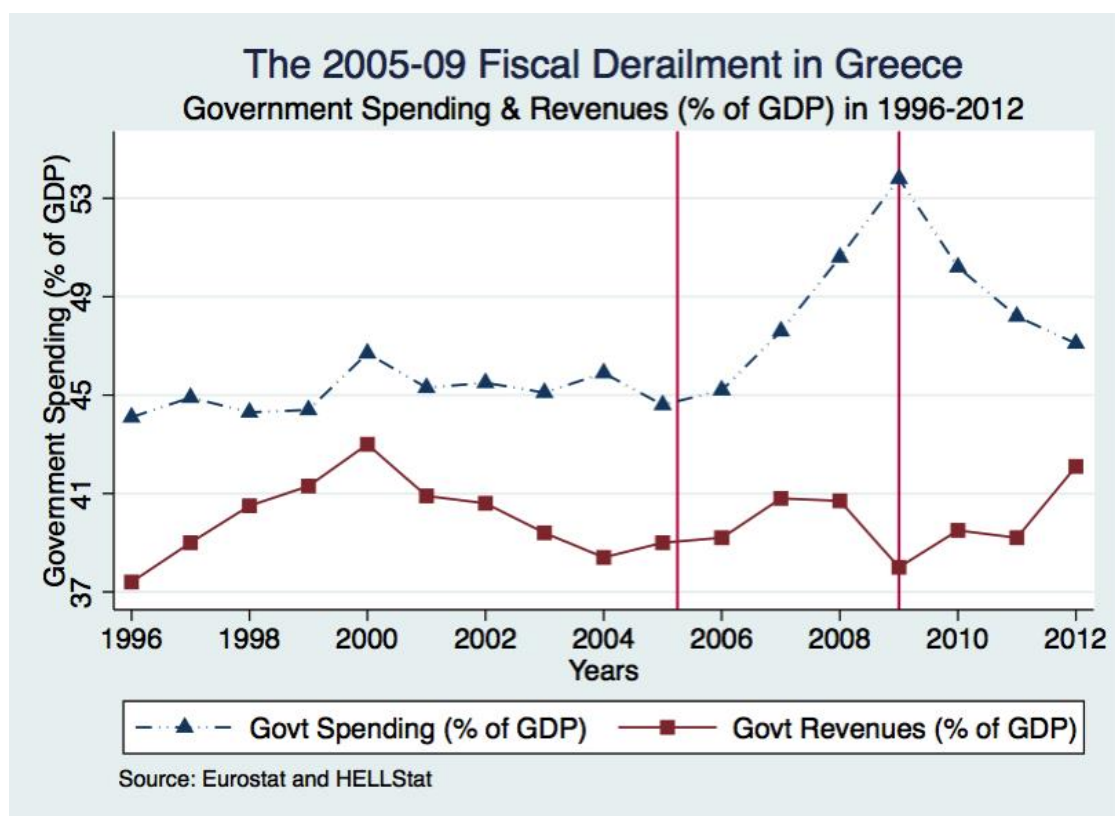


Fig. 2: The Evolution of Greek Government Spending and Revenues (as % of GDP) from 1996 to 2012

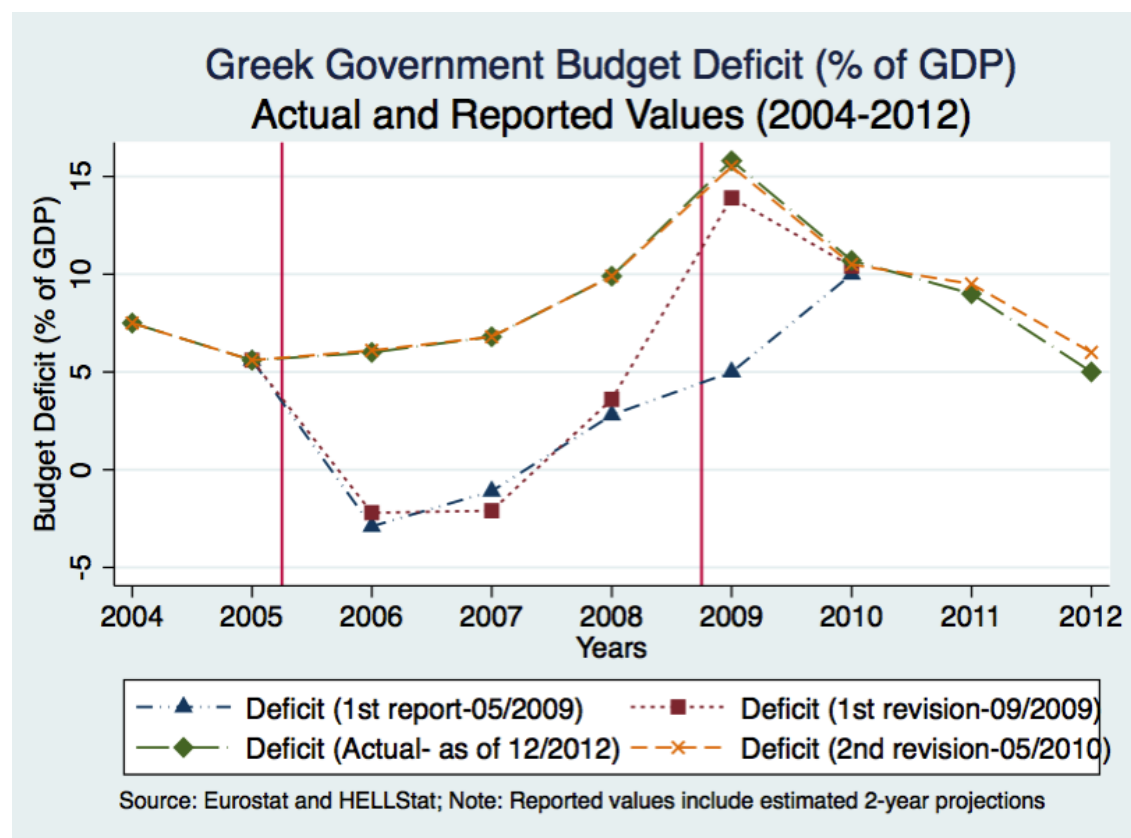


Fig. 3: The Information Shock on Greek Deficit (2005-08): Actual vs. Reported Data

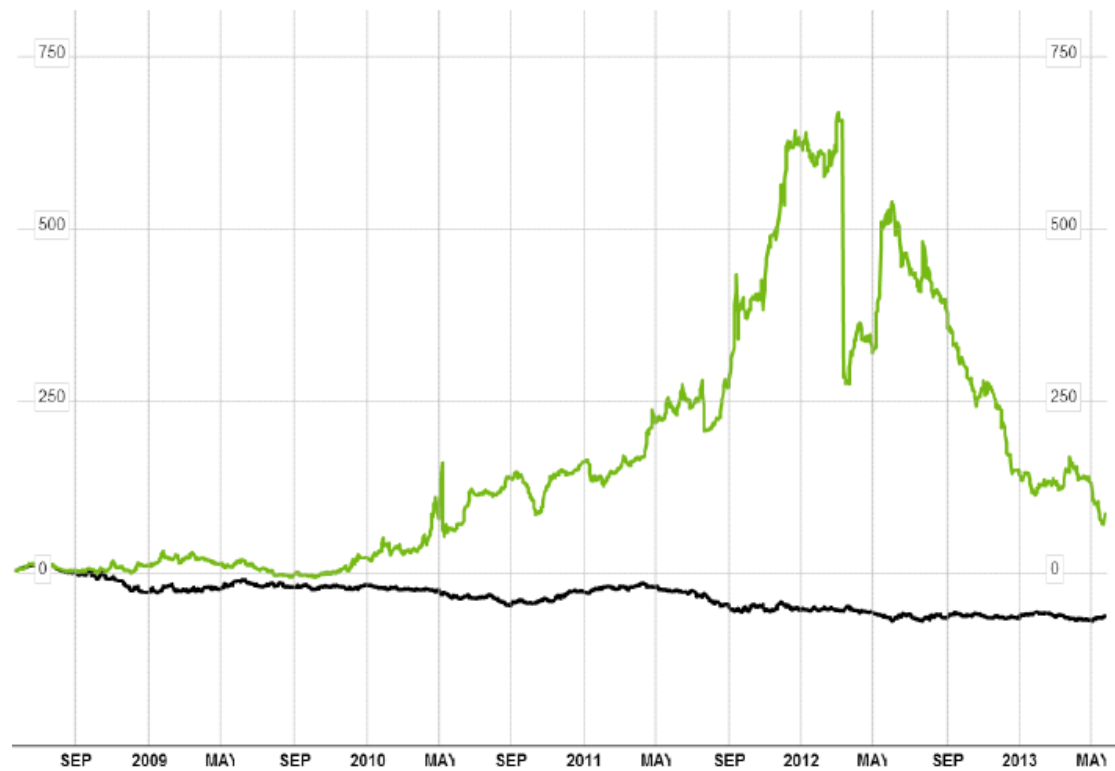


Fig. 4: The Evolution (May 2008 - May 2013) in the Spread on the Yield of the Greek (green) against the German (black) 10-year Government Bond (Source: Bloomberg)

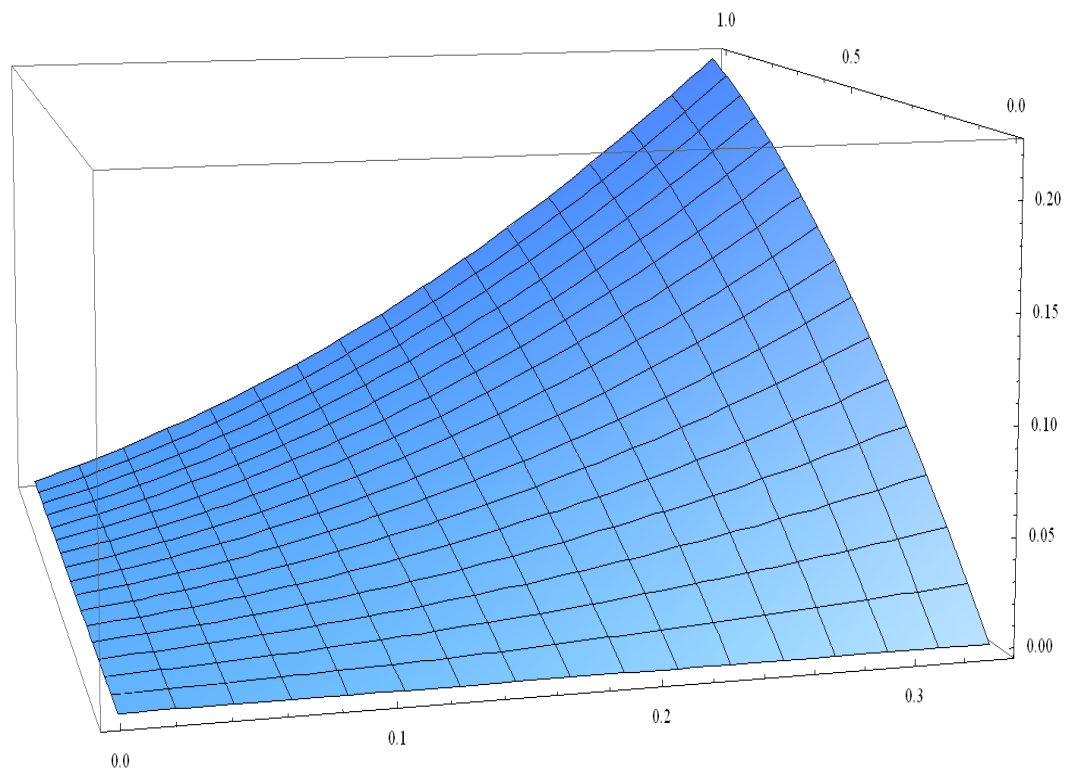


Fig. 5: The increase in the degree of electoral fragmentation –height– as a function of: a) the pre-cuts size of public sector transfers, –length– and b) the size of the cuts –width.

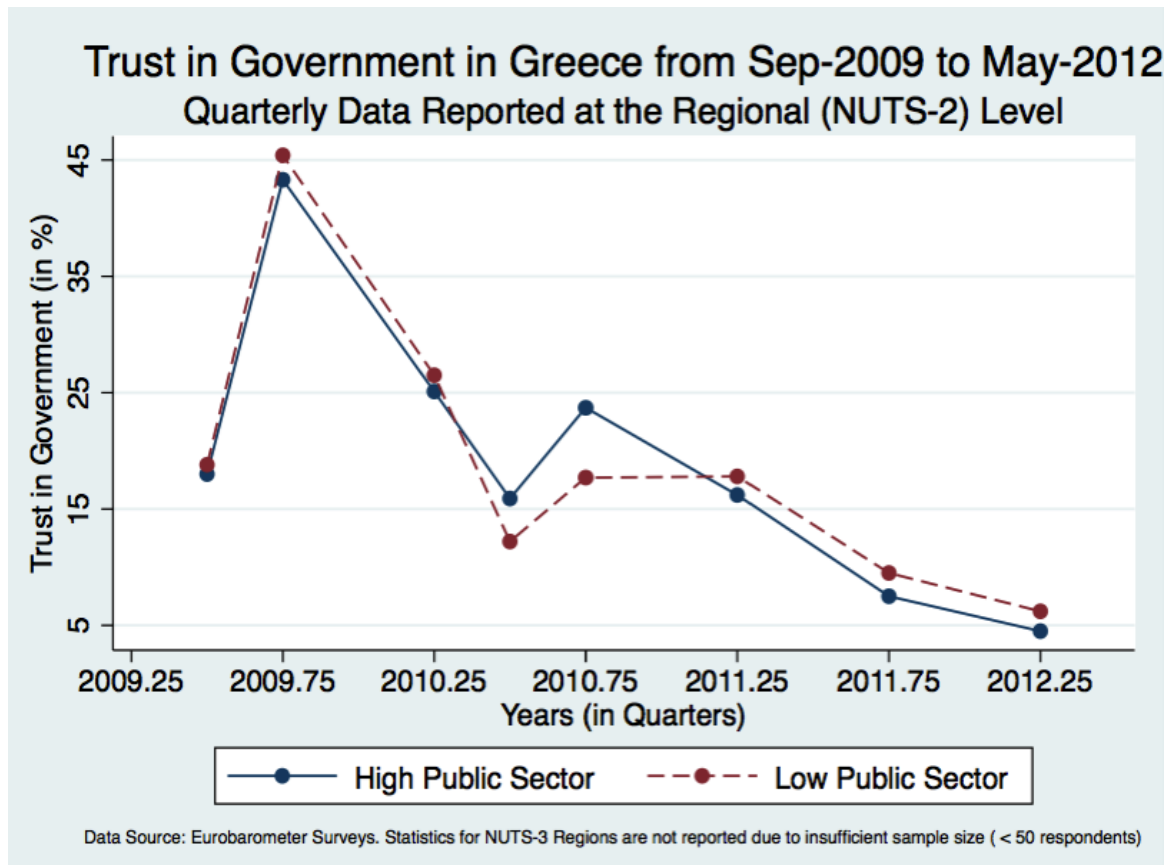


Fig. 6.a: Evolution of Trust towards the Government in Greece. Quarterly Data from Q.2 (2009) to Q.1 (2012).

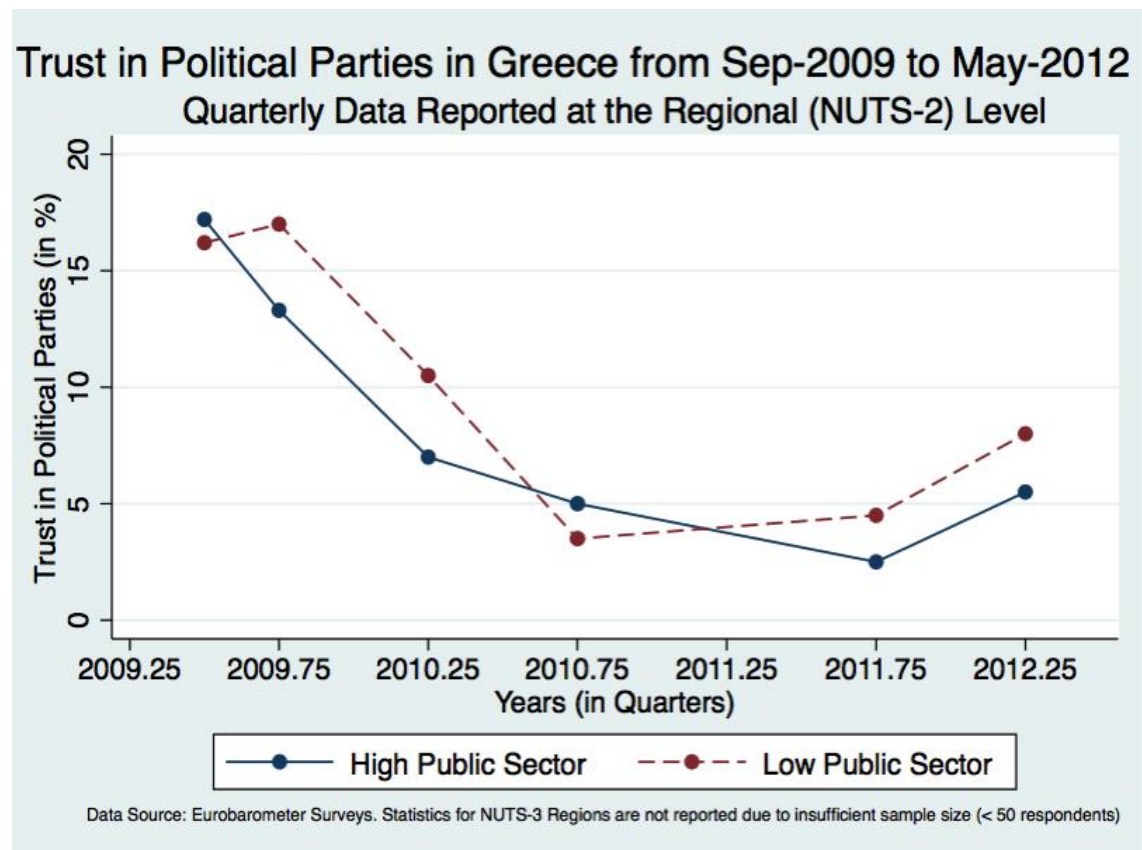


Fig. 6.b: Evolution of Trust towards the Political Parties in Greece. Quarterly Data from Q.2 (2009) to Q.1 (2012).

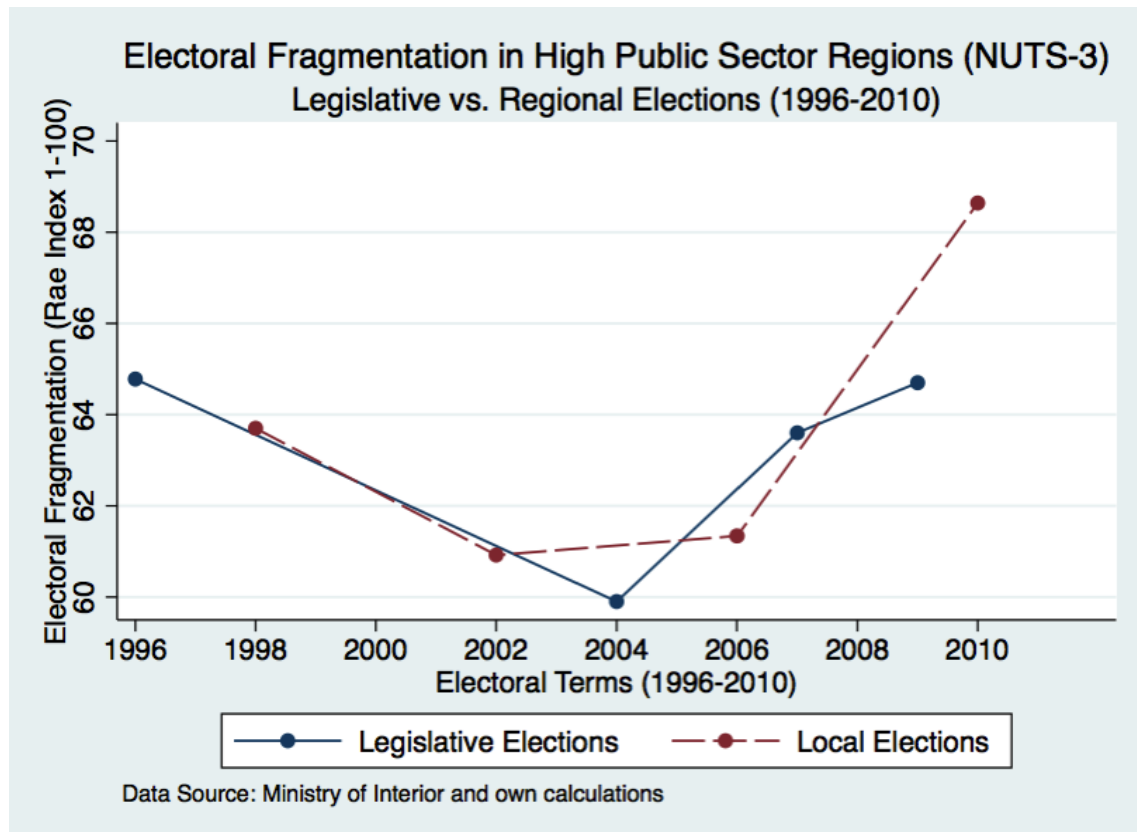


Fig. 7.a: The Parallel Trend of Electoral Fragmentation between Legislative and Regional Elections in High Public Sector Regions (NUTS-3) from 1996 to 2010.

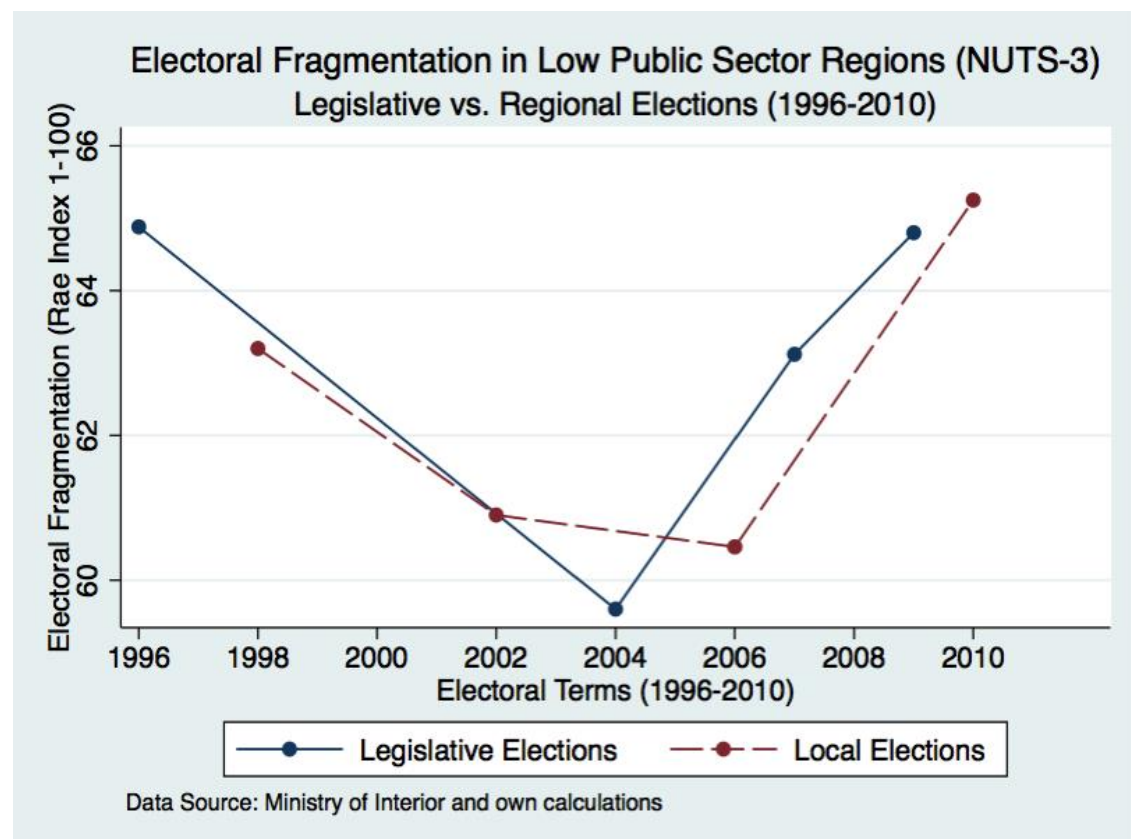


Fig. 7.b: The Parallel Trend of Electoral Fragmentation between Legislative and Regional Elections in Low Public Sector Regions (NUTS-3) from 1996 to 2010.

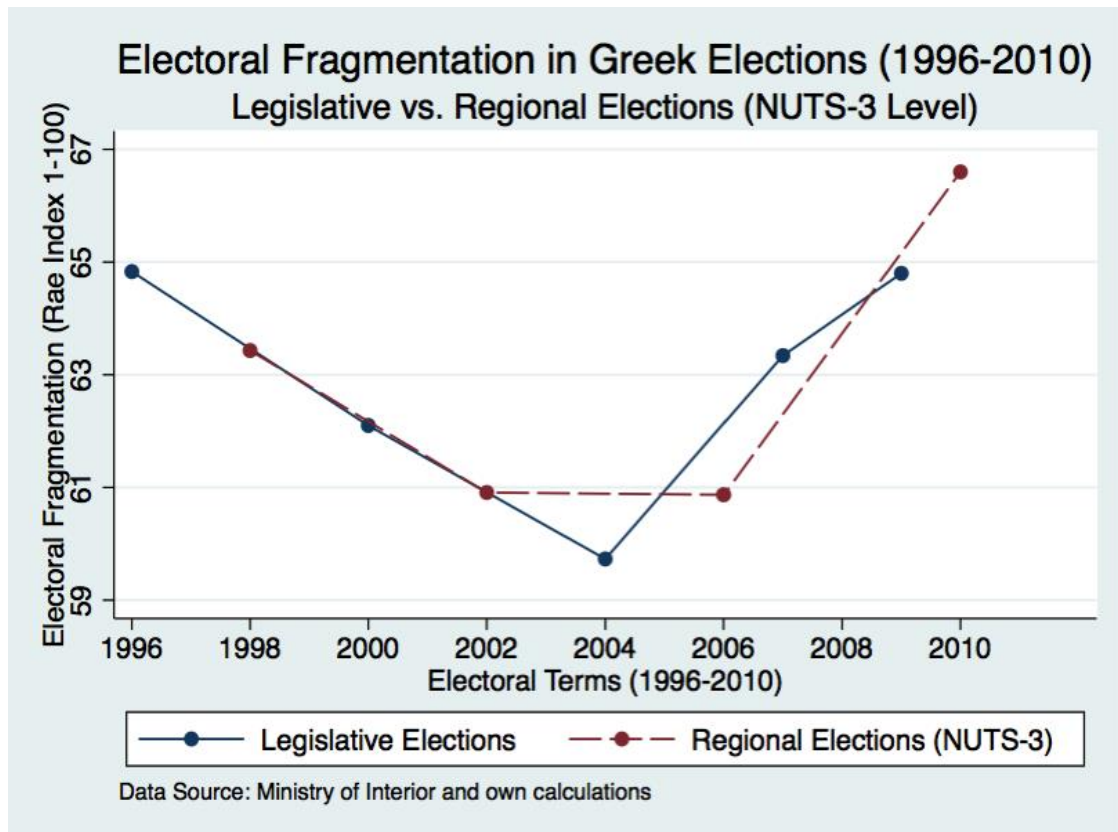


Fig. 8: Comparison of the Trend of Electoral Fragmentation between Legislative and Regional Elections in Greece from 1996 to 2010.

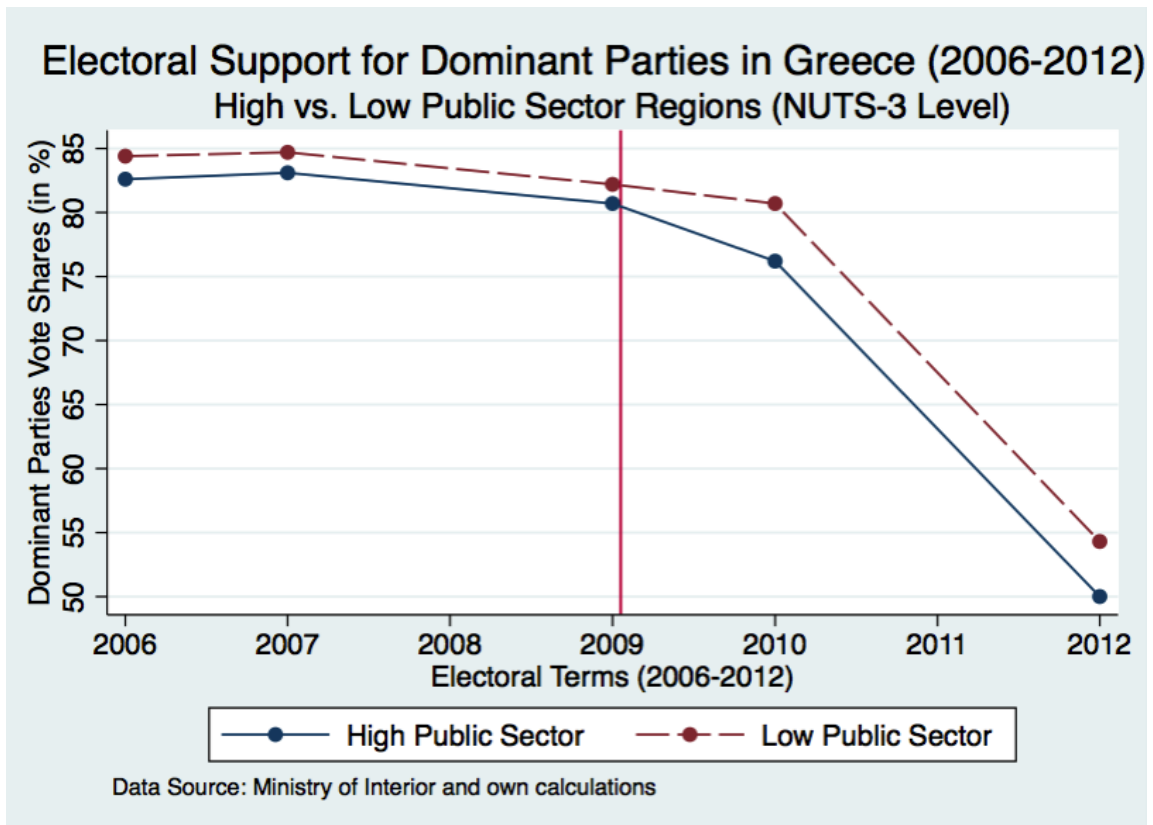


Fig. 9.a: Electoral Support (% of votes) for Dominant Parties (PASOK & ND) across High and Low Public Sector Regions (NUTS-3) in Greek Elections (2006-2012)

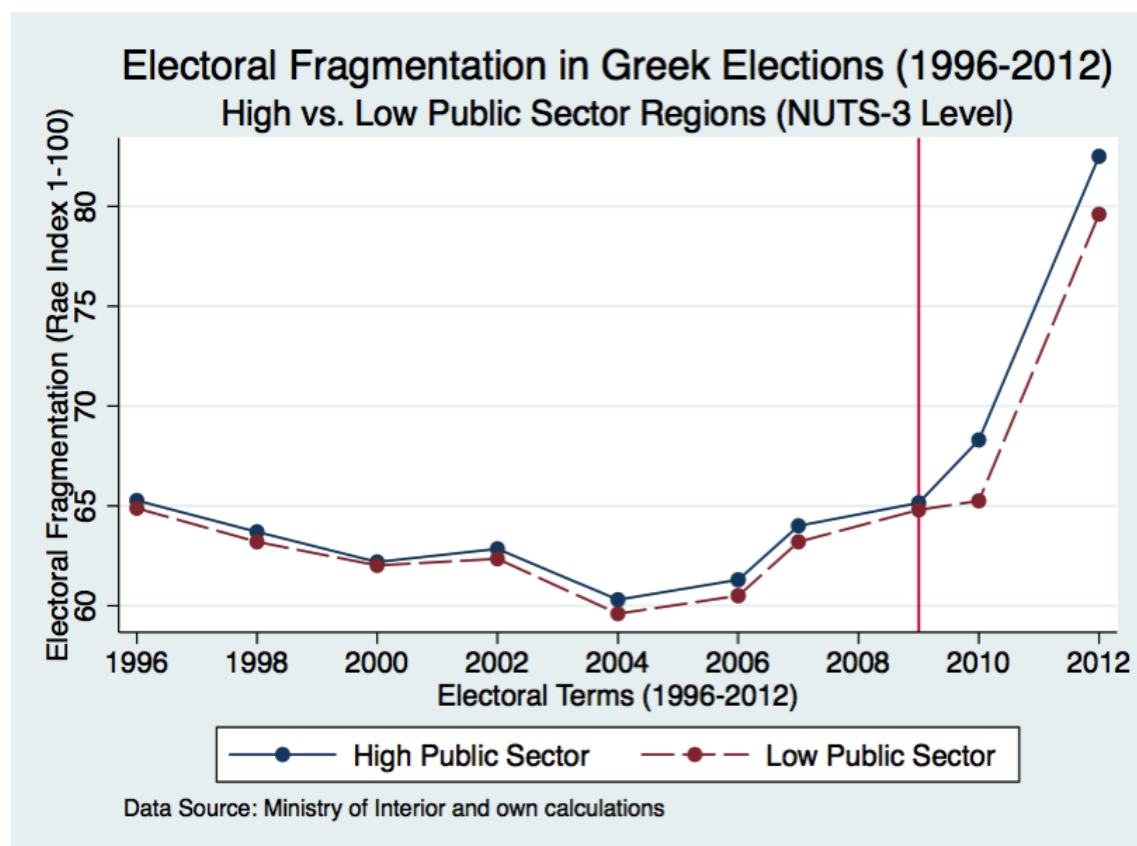


Fig. 9.b: Electoral Fragmentation (Rae Index) in Greek Elections (1996-2012) Across High and Low Public Sector Regions (NUTS-3)

5.2 Tables

TABLE A.1: *WEIGHTED-OLS REGRESSIONS ON THE DIFFERENTIAL IMPACT OF THE INFORMATION SHOCK AT THE NUTS-2 LEVEL (SIX ELECTION SAMPLE 2002 – 2010) WITH THE INCLUSION OF TREATMENT LEAD AND LAG TERMS*

Dependent Variable	Electoral	PASOK & ND
	Fragmentation	vote shares
Control Variables	(1)	(2)
<i>POST</i> (Year 2010)	5.855 (0.886)**	0.254 (5.247)
<i>HIGH PS</i> * <i>POST</i> (Year 2010)	7.024 (3.002)*	-15.746 (7.209)*
Regional (NUTS-2) unemployment rate (in %)	-0.198 (0.374)	-0.045 (0.846)
Incumbent re-elected (dummy)	0.865 (1.020)	-3.724 (1.714)
Net migration rate (in %)	0.123 (0.056)*	0.023 (0.128)
PASOK candidates had joint support	0.087 (1.543)	-2.257 (3.881)
ND candidate had joint support	-1.929 (1.368)	1.297 (5.958)
Region fixed effects?	Yes	Yes
Year fixed effects?	Yes	Yes
Treatment leads/lags?	Yes	Yes
R^2	0.94	0.83
N (obs)	78	78

* $p < 0.05$; ** $p < 0.01$

Note: Robust standard errors clustered at the NUTS-2 region level reported in parentheses. 13 NUTS-2 regions included.

6. Appendix B: Supplementary Material (Online Appendix – Not for Publication)

6.1 The Greek Party-System: History and Structure

Since 1974 Greece has had a stable bipartisan political system dominated by two political parties (the centre-right *Nea Dimokratia* and the centre-left *PASOK*) which used to alternate in office. As a result, up until recently (June 2012) coalition governments were never formed and single-party governments were the norm. The number of parties contesting elections and represented in Parliament remained relatively small and stable over the years.¹ The two major parties (*PASOK* and *Nea Dimokratia*) were always collecting *at least* 80% of the votes. Moreover, voter turn-out was always very high, historically ranging around 80 percent. This implies that the Greek party-system is characterized by stable bipartisanship and large political participation. That is, the Persson et al. (2007) argument that stresses the link from coalition governments to high public spending is not applicable in Greece.²

Apart from its bipartisan nature, another key characteristic of the Greek party-system is its prevalent clientelism and patronage relations which lie at the heart of political competition. For almost thirty years, the two major parties used their influence in the administration to favour their clientele by offering public sector appointments and other privileges. Until 1994, when the independent Supreme State Council for Civil Service Personnel Selection [*Anotato Simvoulío Epilogis Prosopikou*] was instituted, public sector was viewed as the electoral prize for the winning party. Consequently, public sector appointments were primarily made according to partisan affiliation and political favouritism, in complete absence of meritocracy. Furthermore, once the *Council* was instituted, the practice of non-meritocratic public sector appointments, and the subsequent clientelistic link, passed from the central government to regional administrations.³ Though independent in letter, in practice Greek local authorities remained financially and politically dependent on the political parties reducing the level of their autonomy to a simple mid-term

¹ In addition to the two major ones there were on average three smaller parties contesting the elections and securing representation in the Parliament. Yet, their combined vote shares never exceeded 20 percent, until of course the 2012 elections.

² In fact, the Greek case provides a counter-argument to Persson et al. (2007). The recent grand-coalition government was an outcome of the economic crisis not a causal factor, since a coalition government has never occurred before. It was the severe debt crisis that forced the *PASOK* government, which held an absolute majority in the Parliament to seek the support of the opposition in passing the austerity measures.

³ It is not a coincidence that the majority (around 300,000) of those employees who were hired under fixed-term renewable contracts during the 2005-09 period were employed by local governments and municipalities.

ballot opportunity which was used by parties in order to count electoral power with an eye to the forthcoming electoral battle. Hence, partisan favouritism spread from elected parliamentarians to elected local administration officers (e.g. mayors and regional governors) leaving the clientelistic nature of the Greek political system intact.

6.2 Greek Local Government: Structure and Operation

In this section we present a very brief outline of the structure, functions and sources of income of local government in Greece. Until 1994, the only elected forms of local government were municipal and community councils, representing the first level of local government under the Constitution (Article 102/1).⁴ However, in 1994 the Greek Parliament adopted a reform of the local government system (Laws 2218/94 and 2240/94) establishing elected prefectural administrations at the NUTS-3 level (*Nomoi*).⁵ These laws were formally implemented in January 1995, and the first ever local elections at the prefecture level took place in 1998. Since then, local elections take place regularly every 4 years. These reforms brought about major changes in the system of local government since they introduced another field for political competition.

At a regional level, Greece is divided into *Peripheries* (NUTS-2 regions) and further into prefectures (NUTS-3 regions) known as *Nomoi*. The basic units of local administration are the municipalities [*Demos*], of which there 227 in total presently.⁶ The 48 *Nomoi* (NUTS-3 regions) are “de-concentrated units of central government, covering certain decentralized state services” and their role is to “formulate proposals to the central government on works and policies of national importance concerning the region” (Law 2240/94). Nevertheless, despite the important role that they are supposed to play, in practice, due to inadequate funding, many of those assigned responsibilities still remain in paper. Through the prefectural system, the central authorities also have extensive control over the municipalities. Overall, as the Council of Europe (CoE) highlights: “... [I]t is not an exaggeration to say that the structure of the Greek local government has not changed very much since the beginning of this century.” The reason is that legislative changes were not accompanied by the transfer of real political and financial power to local jurisdictions. As a

⁴ Article 102/1 of the Greek Constitution provides for the institution of local government in the following terms: “The administration of local affairs shall be exercised by local government agencies, the first level of which comprises municipalities and communities. Other levels shall be specified by law.”

⁵ Laws 2218/94 and 2240/94 established the second level of local government in Greece, which is called Prefectural Self-Government and which has no relation with the first level in terms of hierarchy.

⁶ After the last reform of 2006. Previously there were about 500 of them.

result, central government still maintains a key role in determining policies, even at the local level.

6.3 The Finances of Greek Local Government

According to the report of the European Commission (1994) “The proportion of GDP accounted for by the public sector in Greece is approximately 48 per cent, which is only slightly below the average of all the OECD countries.” Yet, as the report notes, “local governments administrate less than 20 per cent of these resources - equivalent to 8 per cent of the GDP, which is well below the OECD average.”

6.3.1 Expenditures

Until 1990, the Greek local authorities had fairly limited areas of responsibility, related to elementary services such as water supply, waste collection and recreation. But as part of the administrative reforms implemented in the mid 1990s, there has been an attempt to decentralize some state responsibilities to the Greek local authorities (e.g. traffic rules enforcement and policing). These powers are described in the laws mentioned above (2218/94 and 2240/94) and the transfer is taking place in stages to ensure a smooth transition from the one system to the other. Yet, this process remains still incomplete.⁷

Within the social sector most of the functions of local authorities involve shared responsibility. Furthermore, local authorities have no independent responsibilities in the educational sector. In practice though, due to inadequate funding this has rarely occurred. What is most commonly observed is that “... [M]any services which formally fall within the competence of the municipalities are carried out by central government agencies because of the inability of small, financially non-viable local units. These include public utilities, waterworks, irrigation works, sewage systems, roads and other public infrastructure projects” as the European Commission report notes. When one takes into account that most capital projects are funded through state grants, it becomes clear that local government discretionary spending falls to less than 10 per cent of its total spending. As a result, in practice local administrations in Greece act as distributors of central government money

⁷ In fact, if anything, the recent trend is one of reverting recent progress and transferring some of those responsibilities back to the central government. For example, in July 2013 municipal police forces were disbanded and merged with national police under the unified command of the Greek National Police Headquarters.

rather than autonomous entities.

6.3.2 Revenues

The situation is more or less identical when it comes to local government revenues. Local government finances were largely dependent on the extent to which the government of the day handed out state subsidies to local authorities. Law no. 1828/89 laid down the specific sources for local government funding with a fixed percentage coming from each source of income. Denny and Smith (1993), provide data on how Greek local authorities finance their activities. The main sources of local revenues are central government transfers - either in the form of tax sharing or grants and subsidies. Another significant component of local government revenues comes from EU's regional development and structural funds. Together, these two sources of finance constitute more than two-thirds of total local government revenues. They note that: "Central government grants have become an increasingly important part of local government revenues over the years." This aspect of Greek local government further exacerbates its dependency from central government and dominant parties.⁸

When it comes to local taxes, the Greek municipalities have very limited authority to set their own tax policies. According the report of the *CoE* "there are only three types of taxes over which local government has some control. These are: taxes on electrified areas, taxes on immovable property and the advertisement tax."⁹ Most importantly, local governments in Greece have no legislative power to set or collect local taxes. All local taxation in Greece is levied under central government legislation ... and [own taxation] is collected by central government on behalf of local authorities." The receipts from the shared tax revenues¹⁰ are distributed to the NUTS-3 regions and municipalities according to a formula, primarily based on population density (CoE 1993). A final source of funding can come from various forms of loans.¹¹ The main credit institution for local governments is the "Loan and Consignment Fund". Loans from this fund can, under certain circumstances, be granted to local authorities at interest rates lower than at the private capital market. All these reveal in a stark manner that the financial autonomy of local government in Greece is severely undermined. Hence, it comes as no surprise that local and central politics are so

⁸ In 1975 these grants only accounted for 16% of the local revenues (Denny and Smith 1993).

⁹ Upper and lower limits for these tax rates are determined by the central government.

¹⁰ Shared tax revenues are referred to formally as "ordinary grants" to the local authorities.

¹¹ Loans account for approximately 10% of their revenues (Denny and Smith 1993)

interdependent and interconnected.

6.4 The Relationship between National and Local Politics

The lack of financial autonomy of Greek local administration resulted in the lack of autonomy in another equally important sphere: politics. Since most of the resources towards local administrations are coming from a common source, central government, it is not unusual for governments and political parties to interfere very actively in local politics. In fact, in most of the cases, and certainly for the case of prefectural elections, political parties and governments are very actively involved. In other words, local politics are seen as a continuation of central politics at another domain. The most common pattern of involvement in local politics is the following: political parties represented in the Parliament always endorse openly candidates for local elections. Usually, their endorsed candidates are high-profile, high-ranking party officials. Partisan endorsement and affiliation are two extremely important factors for electoral success (only few NUTS-3 administrations have had an independent, non-affiliated and non-endorsed by any party chair-person).¹² As a result, clientelism and partisan favouritism also make their appearance in local politics. The most usual form they take is that of public sector appointments.

Moreover, the similarities among national and local elections extend to the electoral rule, which is a form of PR with a run-off.¹³ Hence, there is no incentive for strategic voting neither in national nor in the first round of local elections. Voting for a non-winning candidate endorsed by a smaller party won't affect the final outcome.¹⁴ Since we measure electoral fragmentation and voter turnout during the first round of local elections, when all candidates and parties participate in the electoral contest, the two electoral rules are equivalent in terms of induced voting behaviour. Moreover, the existence of a run-off ensures that no coalition administration ever takes place at the local level, another similarity between national and local politics. Therefore, there is no need to worry about the impact of coalition governments, through the electoral rule, on economic outcomes.

¹² Party members who disagree with leadership's choices or want to express a general disagreement against its pursued policies may enter the race as "rebel" candidates. This is very common in Greek local elections.

¹³ In local elections, if no candidate gets the absolute majority a second round takes place.

¹⁴ If there is a winner in the first round this means that she got more than 50% of the total votes. Hence, voting strategically would have had no effect. On the other hand, if no candidate gets the absolute majority in the first round, the run-off takes place among the first two in the previous round. The equivalence of those two electoral systems is also stressed by Duverger (1954).

For all the above reasons, local elections are highly politicized. Moreover, the fact that they take place every four years between national elections, gives them a flavour of mid-term elections where the performance of government is implicitly evaluated. Hence, electoral and voting behaviour in local elections is almost identical with national ones. Stylized evidence (Figs. 6 and 7) provide a very good visualization of this point. Both within and across groups, voting behaviour (electoral fragmentation) in local elections appears to follow an identical trend with national ones. In most cases the two lines coincide. Therefore, we conclude that local elections act as a proxy for mid-term national Elections. Since the political characteristics between national and local elections are identical we need not worry for combining electoral data from both of them in our analysis.